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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
June 2, 1987. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Decision Without Hearing as of July 1987

Chemical Discipline	–	April 8, 1986
Mechanical Discipline	–	January 8, 1985
Electrical Discipline	–	May 3, 1985

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of July 1987

Chemical	–	May 6, 1985
Electrical	–	November 6, 1984
Mechanical	–	October 7, 1984

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of July 1987

Affirmed	233
Affirmed-in-Part	34
Reversed	109
Total Decided	376

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that mainte-

nance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on August 28, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,467,475 through 4,468,814
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JUNE 14, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,387,474	06/304,844	6/14/83
4,387,477	06/302,314	6/14/83
4,387,491	06/288,630	6/14/83
4,387,517	06/233,562	6/14/83
4,387,518	06/271,550	6/14/83
4,387,522	06/370,104	6/14/83
4,387,525	06/283,505	6/14/83
4,387,527	06/241,911	6/14/83
4,387,529	06/220,414	6/14/83
4,387,530	06/232,395	6/14/83
4,387,532	06/244,407	6/14/83
4,387,534	06/291,300	6/14/83
4,387,538	06/308,856	6/14/83
4,387,540	06/298,587	6/14/83
4,387,559	06/263,288	6/14/83
4,387,566	06/242,452	6/14/83
4,387,587	06/274,416	6/14/83
4,387,591	06/256,327	6/14/83
4,387,603	06/306,162	6/14/83
4,387,604	06/228,779	6/14/83
4,387,613	06/230,439	6/14/83
4,387,615	06/321,403	6/14/83
4,387,623	06/301,384	6/14/83
4,387,636	06/266,793	6/14/83
4,387,637	06/292,955	6/14/83
4,387,638	06/340,293	6/14/83
4,387,657	06/287,292	6/14/83
4,387,658	06/340,667	6/14/83
4,387,662	06/354,486	6/14/83
4,387,669	06/362,913	6/14/83
4,387,671	06/283,068	6/14/83
4,387,688	06/409,248	6/14/83
4,387,689	06/263,922	6/14/83
4,387,692	06/226,234	6/14/83
4,387,698	06/245,774	6/14/83
4,387,700	06/265,852	6/14/83
4,387,702	06/244,515	6/14/83
4,387,706	06/252,951	6/14/83
4,387,708	06/264,970	6/14/83
4,387,709	06/282,432	6/14/83
4,387,713	06/284,409	6/14/83
4,387,719	06/314,455	6/14/83
4,387,722	06/251,713	6/14/83
4,387,733	06/265,340	6/14/83
4,387,735	06/348,832	6/14/83
4,387,736	06/314,703	6/14/83
4,387,743	06/252,041	6/14/83
4,387,750	06/313,968	6/14/83
4,387,752	06/296,576	6/14/83
4,387,761	06/216,539	6/14/83
4,387,765	06/332,877	6/14/83
4,387,772	06/302,055	6/14/83
4,387,778	06/298,276	6/14/83
4,387,779	06/280,951	6/14/83
4,387,781	06/230,866	6/14/83
4,387,802	06/286,329	6/14/83
4,387,804	06/346,512	6/14/83
4,387,806	06/273,623	6/14/83
4,387,807	06/308,416	6/14/83
4,387,817	06/312,804	6/14/83
4,387,828	06/307,807	6/14/83

Patent Number	Serial Number	Issue Date
4,387,831	06/217,552	6/14/83
4,387,833	06/216,191	6/14/83
4,387,835	06/250,382	6/14/83
4,387,836	06/281,888	6/14/83
4,387,837	06/295,703	6/14/83
4,387,838	06/303,201	6/14/83
4,387,839	06/268,568	6/14/83
4,387,844	06/269,139	6/14/83
4,387,850	06/220,379	6/14/83
4,387,852	06/301,404	6/14/83
4,387,872	06/274,435	6/14/83
4,387,876	06/279,408	6/14/83
4,387,881	06/280,062	6/14/83
4,387,884	06/341,151	6/14/83
4,387,885	06/375,962	6/14/83
4,387,890	06/282,923	6/14/83
4,387,892	06/306,109	6/14/83
4,387,903	06/251,610	6/14/83
4,387,908	06/259,405	6/14/83
4,387,909	06/222,983	6/14/83
4,387,919	06/300,435	6/14/83
4,387,921	06/264,836	6/14/83
4,387,922	06/270,648	6/14/83
4,387,938	06/245,278	6/14/83
4,387,962	06/308,976	6/14/83
4,387,974	06/262,152	6/14/83
4,387,976	06/276,818	6/14/83
4,387,981	06/219,511	6/14/83
4,387,992	06/266,137	6/14/83
4,387,998	06/265,511	6/14/83
4,388,005	06/257,479	6/14/83
4,388,006	06/239,981	6/14/83
4,388,008	06/237,516	6/14/83
4,388,011	06/253,178	6/14/83
4,388,020	06/298,471	6/14/83
4,388,026	06/258,973	6/14/83
4,388,028	06/221,345	6/14/83
4,388,035	06/261,766	6/14/83
4,388,037	06/231,604	6/14/83
4,388,050	06/248,494	6/14/83
4,388,054	06/255,732	6/14/83
4,388,060	06/328,234	6/14/83
4,388,071	06/324,613	6/14/83
4,388,077	06/291,188	6/14/83
4,388,080	06/348,468	6/14/83
4,388,082	06/317,748	6/14/83
4,388,090	06/278,555	6/14/83
4,388,105	06/287,350	6/14/83
4,388,109	06/264,724	6/14/83
4,388,130	06/326,768	6/14/83
4,388,143	06/317,682	6/14/83
4,388,144	06/245,113	6/14/83
4,388,152	06/341,381	6/14/83
4,388,153	06/323,182	6/14/83
4,388,159	06/264,311	6/14/83
4,388,165	06/298,343	6/14/83
4,388,167	06/413,133	6/14/83
4,388,182	06/295,150	6/14/83
4,388,184	06/418,046	6/14/83
4,388,187	06/359,293	6/14/83
4,388,205	06/318,691	6/14/83
4,388,207	06/366,081	6/14/83
4,388,223	06/251,434	6/14/83
4,388,239	06/324,201	6/14/83
4,388,260	06/223,465	6/14/83
4,388,286	06/343,046	6/14/83
4,388,315	06/307,117	6/14/83
4,388,340	06/308,710	6/14/83
4,388,357	06/273,403	6/14/83
4,388,361	06/221,638	6/14/83
4,388,389	06/321,656	6/14/83
4,388,409	06/337,680	6/14/83
4,388,410	06/223,856	6/14/83
4,388,424	06/318,472	6/14/83
4,388,427	06/301,152	6/14/83
4,388,435	06/320,020	6/14/83
4,388,438	06/224,476	6/14/83
4,388,458	06/334,118	6/14/83
4,388,462	06/284,896	6/14/83
4,388,468	06/293,853	6/14/83
4,388,478	06/316,800	6/14/83
4,388,484	06/307,794	6/14/83
4,388,485	06/247,078	6/14/83
4,388,487	06/333,914	6/14/83
4,388,494	06/222,475	6/14/83
4,388,507	06/306,153	6/14/83
4,388,510	06/273,233	6/14/83
4,388,511	06/265,358	6/14/83
4,388,516	06/248,632	6/14/83
4,388,533	06/246,118	6/14/83
4,388,536	06/390,359	6/14/83
4,388,561	06/237,269	6/14/83
4,388,567	06/238,089	6/14/83
4,388,569	06/307,944	6/14/83
4,388,580	06/321,580	6/14/83
4,388,588	06/242,086	6/14/83
4,388,605	06/312,893	6/14/83
4,388,613	06/335,977	6/14/83
4,388,614	06/216,103	6/14/83
4,388,616	06/240,646	6/14/83
4,388,620	06/222,480	6/14/83
4,388,622	06/254,237	6/14/83
4,388,631	06/243,055	6/14/83
4,388,654	06/244,665	6/14/83
4,388,698	06/276,277	6/14/83
4,388,711	06/287,959	6/14/83
4,388,714	06/293,152	6/14/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,305,763, Re. S.N. 075,838, Filed July 20, 1987, Cl. 148/12.7A, METHOD OF PRODUCING AN ALUMINUM ALLOY PRODUCT, William E. Quist, et al., Owner of Record: *Boeing Co., Seattle, Wash.,* Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 111

4,444,800, Re. S.N. 064,192, Filed June 19, 1987, Cl. 426/582, NON-CULTURED SIMULATED CHEESE CONTAINING RENNET CASEIN, Howard H. Bixby, et al., Owner of Record: *Schreiber Food, Inc., Green Bay, Wis.,* Attorney or Agent: Roy E. Hofer, et al., Ex. Gp.: 132

4,492,161, Re. S.N. 004,181, Filed Jan. 8, 1987, Cl. 101/109, HIGH SPEED DOCUMENT ENCODING SYSTEM, Gerald L. Johnson, et al., Owner of Record: *Banctec, Inc., Dallas, Tex.,* Attorney or Agent: Kenneth R. Glaser, et al., Ex. Gp.: 337

4,503,062, Re. S.N. 021,220, Filed June 23, 1987, Cl. 514/383, AZOLYL SUBSTITUTED ALICYCLIC ALCOHOLS, Michael B. Gravestock, Owner of Record: *Imperial Chemical Industries PLC, London, England,* Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 125

4,528,953, Re. S.N. 071,738, Filed July 9, 1987, Cl. 123/413, THROTTLE AND TIMING LINKAGE, John D. Flaig, et al., Owner of Record: *Outboard Marine Corp., Waukegan, Ill.,* Attorney or Agent: Bayard H. Michael, et al., Ex. Gp.: 342

4,529,454, Re. S.N. 071,709, Filed July 8, 1987, Cl. 148/36, LOW C-CR-MO STEEL USED UNDER WET STEAM, Fumio Hataya, et al., Owner of Record: *Hitachi Ltd., Tokyo, Japan; Kawasaki Steel Corp., Kobe City, Japan,* Attorney or Agent: George F. Dvorak, et al., Ex. Gp.: 111

4,552,873, Re. S.N. 052,849, Filed May 20, 1987, Cl. 514/210, CARBAPENEM COMPOUNDS, AND CON-

TAINING THEM, Tetsuo Miyadera, Owner of Record: *Sankyo Co., Ltd., Tokyo, Japan,* Attorney or Agent: Stephen H. Frishauf, et al., Ex. Gp.: 125

4,554,308, Re. S.N. 059,262, Filed June 5, 1987, Cl. 524/591, CROSSLINKED POLYURETHANE DISPERSIONS, Andrea Russiello, Owner of Record: *Wilmington Chemical Corp., Wilmington, Del.,* Attorney or Agent: John M. Webb, et al., Ex. Gp.: 155

4,579,854, Re. S.N. 071,741, Filed July 9, 1987, Cl. 514/312, BRONCHODILATING 8-HYDROXY-5-HYDROXY-5[(IR)-1-HYDROXY-2[N-(CIR)-2-(P-METHOXYPHENYL)-1-METHYL-ETHYL) - AMINO]ETHYL] CARBOSTYRIL, Takeo Iwakuma, et al., Owner of Record: *Tanabe Seiyaku Co., Ltd., Osaka-Shi, Japan,* Attorney or Agent: John F. Scully, et al., Ex. Gp.: 125

4,604,557, Re. S.N. 071,993, Filed July 7, 1987, Cl. 65/135, VENDING MACHINE POWER SWITCHING APPARATUS, John C. Cowles, Owner of Record: *Mars Inc., McLean, Va.,* Attorney or Agent: John B. Pegram, et al., Ex. Gp.: 133

4,614,648, Re. S.N. 071,991, Filed July 10, 1987, Cl. 424/44, PROCESS FOR MANUFACTURING EFFERVESCENT GRANULES AND TABLETS, Jean Bru, Owner of Record: *Inventor,* Attorney or Agent: Sidney G. Faber, et al., Ex. Gp.: 125

4,616,605, Re. S.N. 071,734, Filed July 7, 1987, Cl. 123/65, TWO-CYCLE ENGINE WITH IMPROVED SCAVENGING, Herbert E. Kline, Owner of Record: *Cummings Engine Co., Inc., Columbus, Ind.,* Attorney or Agent: Charles M. Leedom, Jr., et al., Ex. Gp.: 342

4,633,859, Re. S.N. 075,340, Filed July 20, 1987, Cl. 128/205.26, INERT GAS ENVIRONMENTAL CONTROL SYSTEM FOR A HYPERBARIC CHAMBER AND A METHOD FOR DOING SAME, Raymond P. Reneau, Owner of Record: *Keyes Offshore, Inc., Sugar Land, Tex.,* Attorney or Agent: A. H. Evans, et al., Ex. Gp.: 355

4,647,544, Re. S.N. 072,699, Filed July 13, 1987, Cl. 436/518, IMMUNOASSAY USING OPTICAL INTERFERENCE DETECTION, David F. Nicoli, et al., Owner of Record: *Inventor,* Attorney or Agent: Charles H. Schwartz, et al., Ex. Gp.: 128

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 29,909, Reexam. No. 90/001,286, Requested: July 13, 1987, Cl. 252/89, METHOD OF CLEANING CONTAMINATED WOUNDS, Leonard D. Kurtz, Owner of Record: *The University of Virginia Alumni Foundation, Charlottesville, Va.,* Attorney or Agent: Larson & Taylor, Ex. Gp.: 110, Requester: Owner

Re. 31,998, Reexam. No. 90/001,290, Requested: July 27, 1987, Cl. 3/13, POSTERIOR CHAMBER LENS IMPLANT, William D. Myers, Owner of Record: *Dr. William D. Myers, Birmingham, Mich.,* Attorney or Agent: S. W. Sprinkle, Ex. Gp.: 330, Requester: Surgidev Corp., Goleta, Calif.

3,485,383, Reexam. No. 90/001,291, Requested: July 28, 1987, Cl. 212/195, AUXILIARY SUPPORT FOR CRANES, Daniel E. Beduhn, Owner of Record: *The Manitowoc Co., Inc., Manitowoc, Wis.,* Attorney or Agent: Unknown, Ex. Gp.: 310, Requester: American Hoist & Derrick Co., St. Paul, Minn.

3,994,711, Reexam. No. 90/001,288, Requested: July 16, 1987, Cl. 65/163, GLASS TEMPERING SYSTEM INCLUDING OSCILLATING ROLLER FURNACE, Harold A. McMaster, Owner of Record: *Glasstech, Inc., Perrysburgh, Ohio,* Attorney or Agent: E. L. Brooks, Ex. Gp.: 130, Requester: Becker & Becker, Dayton, Ohio

4,290,208, Reexam. No. 90/001,285, Requested: July 16, 1987, Cl. 34/9, PROCESS FOR THE DEHUMIDIFICATION OF MOIST AIR OR SATURATED WATER VAPOR, Lars-Gunnar Hellman, Owner of Record: *Inventor, Stockholm, Sweden,* Attorney or Agent: Cohen, Pontani, et al., Ex. Gp.: 340, Requester: Owner

4,330,574, Reexam. No. 90/001,287, Requested: July 15, 1987, Cl. 427/319, FINISHING METHOD FOR CONVENTIONAL HOT DIP COATING OF A FERROUS BASE METAL STRIP WITH A MOLTEN COATING METAL, Marvin B. Pierson, et al., Owner of Record: *Armco, Inc., Middletown, Ohio,* Attorney or Agent: Forst & Jacobs, Ex. Gp.: 150, Requester: Owner

4,436,684, Reexam. No. 90/001,283, Requested: July 13,1987, Cl. 264/138, METHOD OF FORMING IMPLANTABLE PROSTHESIS FOR RECONSTRUCTIVE SURGERY, David N. White, Owner of Record: *Cemax Medical Products Ltd., Santa Clara, Calif.,* Attorney or Agent: Unknown, Ex. Gp.: 130, Requester: Techmedica, Inc., Camarillo, Calif.

4,474,612, Reexam. No. 90/001,282, Requested: July 7, 1987, Cl. 204/252, VERTICALLY EXTENDING PLATE ELECTRODE FOR GAS-FORMING ELECTROLYZERS, Karl Lohrberg, Owner of Record: *Metallgesellschaft Aktiengesellschaft, Frankfurt, Germany,* Attorney or Agent: Felfe & Lynch, Ex. Gp.: 110, Requester: Eltech Systems Corp., Fairport Harbor, Ohio

4,517,283, Reexam. No. 90/001,284, Requested: July 13, 1987, Cl. 430/512, COLOR-PHOTOGRAPHIC RECORDING MATERIAL, David G. Leppard, et al., Owner of Record: *Ciba-Geigy AG, Basle, Switzerland,* Attorney or Agent: Wenderoth, Lind, et al., Ex. Gp.: 150, Requester: Owner

4,608,187, Reexam. No. 90/001,289, Requested: July 20, 1987, Cl. 252/90, RUBBER TOUGHENED POLYVINYL ALCOHOL FILM COMPOSITIONS, Daniel M. Chang, Owner of Record: *The Clorox Co., Oakland, Calif.,* Attorney or Agent: J. S. Siebert, Ex. Gp.: 110, Requester: Owner

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Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of June 16, 1987, were listed inadvertently:

1,442,618	TM 188	June 16, 1987
1,442,619	TM 188	June 16, 1987
1,442,620	TM 188	June 16, 1987
1,442,621	TM 188	June 16, 1987
1,442,626	TM 188	June 16, 1987
1,442,657	TM 189	June 16, 1987
1,442,658	TM 189	June 16, 1987
1,442,659	TM 189	June 16, 1987
1,442,662	TM 189	June 16, 1987
1,442,663	TM 189	June 16, 1987
1,442,693	TM 190	June 16, 1987
1,442,694	TM 190	June 16, 1987
1,442,695	TM 190	June 16, 1987

1,442,696	TM 190	June 16, 1987
1,442,697	TM 190	June 16, 1987
1,442,721	TM 190	June 16, 1987
1,442,722	TM 190	June 16, 1987
1,442,771	TM 191	June 16, 1987
1,442,772	TM 191	June 16, 1987
1,442,773	TM 191	June 16, 1987
1,442,774	TM 191	June 16, 1987
1,442,775	TM 191	June 16, 1987
1,442,776	TM 191	June 16, 1987
1,442,777	TM 191	June 16, 1987
1,442,778	TM 191	June 16, 1987
1,442,779	TM 191	June 16, 1987
1,442,790	TM 192	June 16, 1987
1,442,948	TM 195	June 16, 1987
1,442,949	TM 195	June 16, 1987
1,442,950	TM 195	June 16, 1987
1,442,951	TM 195	June 16, 1987
1,442,952	TM 195	June 16, 1987
1,442,953	TM 195	June 16, 1987
1,442,954	TM 195	June 16, 1987
1,442,955	TM 195	June 16, 1987
1,442,956	TM 195	June 16, 1987
1,442,957	TM 195	June 16, 1987
1,442,958	TM 195	June 16, 1987
1,442,959	TM 195	June 16, 1987
1,442,960	TM 195	June 16, 1987
1,442,961	TM 195	June 16, 1987
1,442,962	TM 195	June 16, 1987
1,442,963	TM 195	June 16, 1987
1,442,964	TM 195	June 16, 1987
1,442,965	TM 195	June 16, 1987
1,442,979	TM 195	June 16, 1987
1,442,980	TM 195	June 16, 1987
1,442,981	TM 195	June 16, 1987
1,442,982	TM 195	June 16, 1987
1,442,983	TM 195	June 16, 1987
1,442,984	TM 195	June 16, 1987
1,442,985	TM 195	June 16, 1987
1,442,986	TM 195	June 16, 1987
1,443,022	TM 196	June 16, 1987
1,443,023	TM 196	June 16, 1987
1,443,058	TM 197	June 16, 1987
1,443,066	TM 197	June 16, 1987
1,443,071	TM 197	June 16, 1987
1,443,146	TM 199	June 16, 1987
1,443,147	TM 199	June 16, 1987
1,443,148	TM 199	June 16, 1987
1,443,149	TM 199	June 16, 1987
1,443,150	TM 199	June 16, 1987
1,443,151	TM 199	June 16, 1987
1,443,152	TM 199	June 16, 1987
1,443,153	TM 199	June 16, 1987
1,443,154	TM 199	June 16, 1987
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1,443,160	TM 199	June 16, 1987
1,443,161	TM 199	June 16, 1987
1,443,162	TM 199	June 16, 1987
1,443,163	TM 199	June 16, 1987
1,443,164	TM 199	June 16, 1987
1,443,165	TM 199	June 16, 1987
1,443,166	TM 199	June 16, 1987
1,443,167	TM 199	June 16, 1987
1,443,168	TM 199	June 16, 1987
1,443,175	TM 199	June 16, 1987
1,443,181	TM 199	June 16, 1987
1,443,210	TM 200	June 16, 1987
1,443,211	TM 200	June 16, 1987
1,443,212	TM 200	June 16, 1987
1,443,213	TM 200	June 16, 1987
1,443,214	TM 200	June 16, 1987
1,443,215	TM 200	June 16, 1987
1,443,216	TM 200	June 16, 1987
1,443,217	TM 200	June 16, 1987
1,443,218	TM 200	June 16, 1987
1,443,254	TM 201	June 16, 1987
1,443,255	TM 201	June 16, 1987
1,443,256	TM 201	June 16, 1987
1,443,257	TM 201	June 16, 1987
1,443,258	TM 201	June 16, 1987
1,443,270	TM 201	June 16, 1987
1,443,271	TM 201	June 16, 1987
1,443,272	TM 201	June 16, 1987
1,443,273	TM 201	June 16, 1987
1,443,274	TM 201	June 16, 1987
1,443,275	TM 201	June 16, 1987
1,443,276	TM 201	June 16, 1987
1,443,277	TM 201	June 16, 1987
1,443,278	TM 201	June 16, 1987
1,443,279	TM 201	June 16, 1987
1,443,280	TM 201	June 16, 1987
1,443,281	TM 201	June 16, 1987
1,443,324	TM 202	June 16, 1987
1,443,325	TM 202	June 16, 1987
1,443,327	TM 202	June 16, 1987
1,443,328	TM 202	June 16, 1987
1,443,329	TM 202	June 16, 1987
1,443,330	TM 202	June 16, 1987
1,443,331	TM 202	June 16, 1987
1,443,332	TM 202	June 16, 1987
1,443,418	TM 204	June 16, 1987
1,443,419	TM 204	June 16, 1987
1,443,420	TM 204	June 16, 1987
1,443,421	TM 204	June 16, 1987
1,443,422	TM 204	June 16, 1987
1,443,423	TM 204	June 16, 1987
1,443,424	TM 204	June 16, 1987
1,443,425	TM 204	June 16, 1987
1,443,426	TM 204	June 16, 1987
1,443,427	TM 204	June 16, 1987
1,443,428	TM 204	June 16, 1987
1,443,429	TM 204	June 16, 1987
1,443,430	TM 204	June 16, 1987
1,443,431	TM 204	June 16, 1987
1,443,432	TM 204	June 16, 1987
1,443,433	TM 204	June 16, 1987
1,443,434	TM 204	June 16, 1987
1,443,435	TM 204	June 16, 1987
1,443,436	TM 204	June 16, 1987
1,443,437	TM 204	June 16, 1987
1,443,438	TM 204	June 16, 1987
1,443,439	TM 204	June 16, 1987
1,443,440	TM 204	June 16, 1987
1,443,470	TM 205	June 16, 1987
1,443,477	TM 205	June 16, 1987
1,443,478	TM 205	June 16, 1987
1,443,479	TM 205	June 16, 1987
1,443,486	TM 205	June 16, 1987
1,443,487	TM 205	June 16, 1987
1,443,496	TM 206	June 16, 1987
1,443,499	TM 206	June 16, 1987
1,443,552	TM 207	June 16, 1987
1,443,583	TM 208	June 16, 1987

Consequently, the certificates of registration bearing the above-identified registration numbers were not issued on the date indicated, and the registration numbers have been vacated.

July 21, 1987.

PATRICIA M. DAVIS,
Administrator for Trademark Operations.

Department of the Treasury
United States Customs Service
Application for Recordation of Trade Name: "BROWNING"

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12) for the recordation under section 42 of the Act of July 5, 1946, as

amended (15 U.S.C. 1124), of the trade name "BROWNING" used by Browning, a corporation organized under the laws of the State of Utah, located at Rte. 1, Morgan, Utah 84050.

The application states that the trade name is used in connection with hunting, camping and sporting goods equipment and accessories and sportswear including shotguns, rifles, black powder rifles, pistols, pistol cases, pistol holsters, flexible gun cases, fitted luggage cases, recoil pads, sight beads, chokes for shotguns, scope mount rings and bases, rifle slings and swivels, magazine plugs, gun oil, gun cleaners, gun safes, pocket knives, knife sharpeners, fishing and hunting knives, knife sheaths, knife honing oil, sleeping bags, coats, jackets, parkas, vests, insulated hunting suits, hoods, rain jackets, rain coats, rain pants, rain suits, rain parkas, underwear, hunting trousers, hunting vests, gloves, mittens, shooting gloves, hats, shirts, belts, belt buckles, insulated boots, waterproof boots, boot laces, boot dressings, socks, wool fleece bedding, archery bows, cross bows, archery gloves, shooting tabs, arm guards, quivers, nontelescopic bow sights and slings, bow cases, target faces, bow strings, fishing rods, rod blanks and cases, hand-pulled golf carts, golf clubs, golf bags and golf club head covers, manufactured in Belgium, France, England, Italy, West Germany, Portugal and Canada.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken in the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Oct. 2, 1987.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229.

For Further Information Contact: Beatrice E. Moore, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

JOHN F. ATWOOD,
July 23, 1987. *Acting Chief, Entry, Licensing and Restricted Merchandise Branch.*

Department of the Treasury
United States Customs Service
Application for Recordation of Trade Name: "TWO'S COMPANY"

Action: Notice of application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "TWO'S COMPANY", a corporation organized under the laws of the State of New York, located at 33 Bertel Ave., Mount Vernon, N.Y. 10550.

The application states that the trade name is used in connection with acrylic and glass vases; stirrers; glass picture frames; glass products; floral accessories; commercial flower containers; Christmas ornaments; silver and silver plated products; napkin rings and vinyl products manufactured in Taiwan, Hong Kong and Japan.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Oct. 2, 1987.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (Rm. 2345).

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchanise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

JOHN F. ATWOOD,
July 23, 1987. *Acting Chief, Entry, Licensing and Restricted Merchandise Branch.*

U.S. Department of Commerce
Patent and Trademark Office

Special Status for Patent Applications Relating to Superconductivity

In his Remarks of July 28, 1987, to the Federal Conference On Commercial Applications of Superconductivity, the President stated that "We need to strengthen patent laws to increase protection for manufacturing processes and speed up the patent process so that it can keep pace with the fast-paced world of high technology." The President also noted that "to most of us laymen, superconductivity was a completely new term, but it wasn't long before we learned of the great promise it held out to alter our world for the better — a quantum leap in energy efficiency that would bring with it a host of benefits, not least among them a reduced dependence on foreign oil, a cleaner environment, and a stronger national economy." The President's Superconductivity Initiative of even date included, as a major administrative component, a proposal "Directing the Patent and Trademark Office to accelerate the processing of patent applications and adjudication of disputes involving superconductivity technologies when requested by the applicants to do so."

In accordance with the President's proposal, the Patent and Trademark Office will, on request, accord "special" status to all patent applications for inventions involving superconductive materials. Examples of such inventions would include those directed to the superconductive materials themselves as well as to their manufacture and application. In order that the Patent and Trademark Office may implement this procedure, we invite all applicants desiring to participate in this program to request that their applications be accorded "special" status. Such requests should be in writing, should identify the application by serial number and filing date, and should be accompanied by a statement under 37 CFR 1.102 that the invention involves superconductive materials. No fee is required. The statement must be verified if made by a person not registered to practice before the Patent and Trademark Office. Decisions whether to accord "special" status on the basis of a request will be made by the appropriate Group Director.

Requests should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

DONALD J. QUIGG,
Aug. 5, 1987. *Assistant Secretary of Commerce and Commissioner of Patents and Trademarks.*

PATENT NOTICES

Certificates of Correction for the Week of Sept. 1, 1987

D. 287,883	4,628,456	4,649,863	4,661,997
D. 289,132	4,629,209	4,650,165	4,662,074
4,324,869	4,630,581	4,651,378	4,662,114
4,377,048	4,631,298	4,652,106	4,662,450
4,432,121	4,631,375	4,652,275	4,662,788
4,438,558	4,631,669	4,653,125	4,663,024
4,487,256	4,632,181	4,653,309	4,663,059
4,489,117	4,632,349	4,653,514	4,663,277
4,498,211	4,632,599	4,654,349	4,663,744
4,513,618	4,633,605	4,654,551	4,664,385
4,533,880	4,633,809	4,654,871	4,664,651
4,538,740	4,634,091	4,656,097	4,664,701
4,557,804	4,636,217	4,656,208	4,664,828
4,558,044	4,637,812	4,656,611	4,664,891
4,569,673	4,638,633	4,656,644	4,664,982
4,587,310	4,639,071	4,657,356	4,665,021
4,588,800	4,639,098	4,657,496	4,665,072
4,591,469	4,639,488	4,657,586	4,665,264
4,591,791	4,639,877	4,658,027	4,666,481
4,591,894	4,640,552	4,658,619	4,667,209
4,593,190	4,642,915	4,658,665	4,667,292
4,593,483	4,643,704	4,658,731	4,667,852
4,594,342	4,643,994	4,658,852	4,667,876
4,597,220	4,644,837	4,659,174	4,667,941
4,600,418	4,645,033	4,659,309	4,668,941
4,604,654	4,645,507	4,659,415	4,669,074
4,608,127	4,645,923	4,659,446	4,669,410
4,608,331	4,646,160	4,659,659	4,669,941
4,615,046	4,646,513	4,659,687	4,670,170
4,617,281	4,646,567	4,660,020	4,670,473
4,618,564	4,646,729	4,660,056	4,670,496
4,619,220	4,646,890	4,660,754	4,670,527
4,620,146	4,647,215	4,660,791	4,670,584
4,621,430	4,647,266	4,661,158	4,670,734
4,623,496	4,647,671	4,661,189	4,671,799
4,624,193	4,649,042	4,661,389	4,673,724
4,624,766	4,649,159	4,661,703	
4,626,099	4,649,333	4,661,769	

Patent and Trademark Office

[Docket No. 70470-7070]

Electronic Data Dissemination Polices and Guidelines

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Proposed Amendment of Electronic Patent Data Dissemination Policies and Guidelines; Request for Public Comment.

SUMMARY: The U.S. Patent and Trademark Office (PTO) issues this notice to request comments on policies and guidelines for the dissemination and distribution of electronic patent and trademark data by the PTO. The purposes of this notice are (1) to inform the public of the PTO's intention to amend its pricing policy for data base products, and to expand the scope of its dissemination policies and guideilnes to encompass patent and trademark electronic data; (2) to explain the current situation with regard to public access to automated patent and trademark search rooms and libraries; and (3) to solicit public comments on the intended proposals. The proposed pricing would amend the policies and guidelines published in 49 FR 24585 on June 14, 1984.

DATE: Comments should be submitted no later than September 21, 1987.

ADDRESS: Comments should be addressed to: Donald J. Quigg, Assistant Secretary and Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, Washington, DC 20231.

FOR FURTHER INFORMATION CONTACT: Bradford R. Huther at 703–557–1572.

SUPPLEMENTARY INFORMATION: This notice follows the form of a notice of proposed rulemaking in that the text of the amendment of policies and guidelines is accompanied by this Supplementary Information section containing introductory and background material.

The Patent and Trademark Office has determined that this notice is not a major rule within the meaning of section 1(b) of Executive Order 12291. Therefore, a Regulatory Impact Analysis has not will be prepared. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this amended policy statement by the Administrative Procedure Act under 5 U.S.C. 553(b)(A), no initial or final Regulatory Flexibility Analysis has to be or will be prepared. This notice does not contain a collection of information for purposes of the Paperwork Reduction Act.

It is the intention of the PTO to revise immediately its pricing policy for the sale of its data base products in compliance with OMB Circular A–130 entitled "Management of Federal Information Resources." Under the revised pricing policy, PTO would recover only the marginal cost (i.e., that amount that is sufficient to cover the costs of reproduction and dissemination). This will result in a lowering of most fees charged for data base products. It is also the intention of the PTO to explain the situation under Pub. L. 99–607, the 1986 legislation authorizing appropriations for the PTO, with regard to public access to the patent or trademark search rooms and libraries, and to solicit public comments on alternatives for funding public access to those search rooms and libraries. Such comments will be considered by the PTO in formulating further modifications to the PTO's current information guidelines and policies, which modifications will be published at a later date in the form of a separate proposed rulemaking.

Background

In response to Pub. L. 96–517, the 1980 legislation which amended patent and trademark laws, the PTO prepared and submitted a plan for the automation of its operations to Congress on December 13, 1982. The plan centered on two basic concepts: the creation of electronic data bases that (1) would replace the PTO's all-paper patent and trademark files, and thereby improve their intergrity and quality; and (2) would support searches, examinations, office actions and other office functions through electronic workstations which would provide text and image retrieval capabilities and perform other automation functions.

Active Federal trademark registrations have been converted to an electronic data base of textual and digital image data. A computer system has been installed to enable examiners to search the data base for textual data and codes describing designs, and within calendar year 1987 will be fully operational to retrieve and display all information as substitute for paper file searches.

An Automated Patent System (APS) is being installed for test and evaluation purposes, using one patent examining group as an operational testbed. Major operational components of APS—large scale computers with conventional magnetic storage devices, a high-speed local area data communications network, and electronic workstations equipped with dual resolution display graphics control devices and laser printers—were interconnected on July 1, 1986, to enable system test and evaluation to begin in the testbed group. Optical disk storage units were subsedquently installed to house the test data base of digital images of U.S. and foreign patents. Other equipment that will be needed to simulate the system's performance under full workload conditions will be installed and evaluated during 1987.

The text of U.S. patents issued since 1975 was entered in the system to provide the data base for use with full text searching capabilities of APS. Images of all U.S. and relected foreign patents in the testbed group's search files have been converted to digital form and are being placed on optical disks for use in electronic classification and combined text classification searches. Work has begun to digitize the entire backfile of U.S. patents. Through exchange agreements with the European and Japanese Patent Offices, European patents issued since 1920 and all Japanese patents have been or will be converted to a common facsimile standard and key patent will be entered for on-line retrieval.

Text search capabilities of APS are now being made available to all PTO examiners. A decision on the deployment of the digital image retrieval and other electronic searching capabilities is planned to be made in 1988. Additional system capabilities for office automation and other administrative support will be added to those already installed in the testbed over the next several months to supplement the search and retrieval capabilities. Examiners will be provided with access to commercial data bases, such as industry-specific data bases, through APS, from the electronic workstations.

At the present time, neither the trademark nor the patent automated systems has been deployed to the public search rooms. It is expected that the trademark automated system could be ready for public deployment prior to the end of the current authorization cycle, which is September 30, 1988. According to the 1987 edition of the Automation Master Plan, full deployment of the automated patent system to the public search room is scheduled for fiscal year 1991. Public evaluation of the automated patent system is scheduled to begin in fiscal year 1987.

Under the provisions of Pub. L. 99–607, which authorizes appropriations through

September 30, 1988, "The Commissioner of Patent and Trademarks may not impose a fee for use of public patent or trademark search rooms and libraries. The costs of such rooms and libraries shall come from amounts appropriated by Congress." In anticipation of the need to propose authorizing legislation for fiscal years 1989 through 1991, comments are being requested regarding three potential funding alternatives to support the automated public search rooms. They are:

(1) *Use of taxpayer revenues.* The costs of supporting the automated public search rooms could be covered by funds appropriated specifically for that purpose by Congress. No statutory changes would be required for this option. Presently, the paper search rooms are being supported with appropriated funds. Under current funding levels and, in the absence of authority to charge fees for this purpose, the public's access to automated search rooms would be restricted.

(2) *Use of general fee revenues.* The marginal costs of supporting the automated public search rooms could be apportioned as a cost of prosecuting an application or derived from the total available fee revenues collected by the PTO. Under this alternative, the costs for the automated public search rooms would be borne by all users of the patent and trademark systems. The user charge prohibition in Pub. L. 99–607 would have to be modified to permit this option.

(3) *Establish specific user charges for access to the public search rooms.* Under this alternative such charges for access to the automated trademark and patent systems in the public search rooms would be consistent with the guidelines of OMB Circular A–130, and would be established through the rulemaking process. The marginal costs for the public search rooms under this alternative would be borne only by those who actually use the public search rooms. The user charge prohibition in Pub. L. 99–607 would have to be rescinded to permit this option.

Electronic Data Dissemination Policies and Guidelines

The Patent and Trademark Office proposes to amend its notice entitled Electronic Patent Data Dissemination Policies and Guidelines, published in 49 FR 24585 on June 14, 1984, as follows:

The title of the guidelines would be changed to read Electronic Data Dissemination Policies and Guidelines.

Guideline III, paragraphs C and D would be amended to read:

C. Fees charged to commercial data base vendors for bulk data developed by the PTO will be based on the marginal cost of providing such distribution services.

D. Normally, arrangements with commercial data base vendors will be non-exclusive. Bulk resale of PTO data by commercial data base vendors will be permitted subject to the terms of each bulk data sales agreement.

A new Guideline V, entitled Data Base Product Pricing would be added as follows:

V. Data Base Product Pricing

Fees charged to the public for U.S. patent and trademark data products will be based on the marginal cost of providing such products.

Dated: August 17, 1987.

Rene D. Tegtmeyer,

Assistant Commissioner for Patents.

[FR Doc. 87–19056 Filed 8–19–87; 8:45 am]

BILLING CODE 3510-16-M

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
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	Boston Public Library	(617) 536-5400 Ext. 265
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	Detroit Public Library	(313) 833-1450
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	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
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	Cleveland Public Library	(216) 623-2870
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 1, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-10-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-07-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	6-26-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-10-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-14-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-28-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during August 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,522,401 to 3,526,003, inclusive
Plant Patents ..... Numbers 2,986 to 2,988 inclusive

REEXAMINATIONS

SEPTEMBER 1, 1987

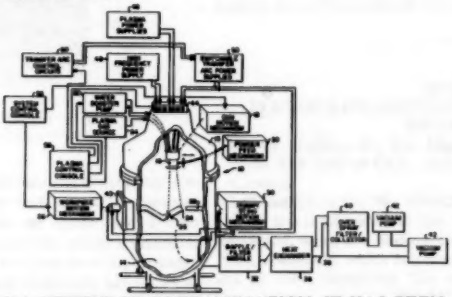
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,328,257 (753rd)

SYSTEM AND METHOD FOR PLASMA COATING

Erich Muehlberger, San Clemente, and Roland D. Kremith, Newport Beach, both of Calif., assignors to Electro-Plasma, Inc., Irvine, Calif.

Reexamination Request No. 90/001,030, Jun. 9, 1986.
Reexamination Certificate for Patent No. 4,328,257, issued May 4, 1982, Ser. No. 97,723, Nov. 26, 1979.
Int. Cl.[4] B05D *1/08*
U.S. Cl. 427—34



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–14** and **27–40** is confirmed.

Claims **16** and **22** are cancelled.

Claims **15, 17, 18, 20, 21** and **23** are determined to be patentable as amended.

Claims **19** and **24–26**, dependent on an amended claim, are determined to be patentable.

1. A transfer arc plasma system comprising:

a plasma gun positioned in operative relation to a workpiece and providing a supersonic plasma stream of substantially inert gas;

enclosure means providing a low static pressure environment about the plasma gun and workpiece;

means coupled to the workpiece for selectively establishing both a cathodic and an anodic relationship of the workpiece relative to the plasma gun and including means for selectively switching between the cathodic and anodic relationships; and

means for injecting spray powder into the plasma stream for deposition on the workpiece.

STATUTORY INVENTION REGISTRATIONS

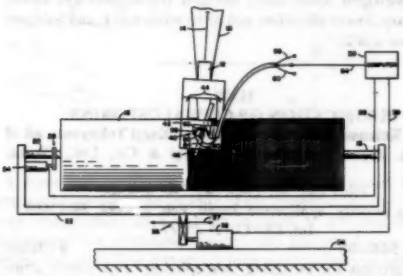
PUBLISHED SEPTEMBER 1, 1987

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H323
ELECTROMECHANICAL LAG ANGLE DETECTOR

Gregory S. Graham, Sylvania, and Harold V. White, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1986, Ser. No. 861,197
Int. Cl.[4] B65H *54/28*
U.S. Cl. 242—158 R **3 Claims**



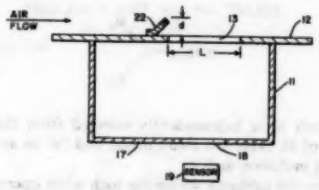
1. An electromechanical lag angle detector device comprising a fixed head mounting fixture with an eyelet mounted thereon with an opening through the eyelet and a fiber mounted through the opening of the eyelet, a support member mounted on the fixed head and a feeler arm pivotally mounted relative to said support member, said feeler arm having a slot therethrough that is aligned with the opening through said eyelet and a contact arm on said feeler arm with a contact of a potentiometer connected thereto for being rotated as the contact arm is rotated by said feeler arm, said support structure also having variable resistor structure of said potentiometer mounted thereon with said contact being in electrical engagement with said variable resistor structure, a power source connected across opposite ends of said variable resistor and said fiber extending through said slot in said feeler arm so that as the fiber is wound on a bobbin, said feeler arm will be actuated by said fiber and thereby actuate said electrical contact of said contact arm to produce an output which is proportional to the variation in lag angle of the fiber that is being wound on the bobbin.

H324
FENCE FOR REDUCING TURBULENCE

Donald V. Rubin, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 27, 1987, Ser. No. 23,492
Int. Cl.[4] B64C *1/00, 30/00*
U.S. Cl. 244—117 R **3 Claims**

1. A system for lowering the level of turbulance in an opening through a wall over which air is flowing at a subsonic velocity; said opening having a predetermined length, L; comprising a fence secured to the aircraft wall at a location adjacent and parallel to a leading edge of said opening; said fence



having only distal portion thereof a plurality, said apertures making up to 50 percent of the area of said distal portion

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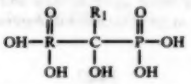
H325
ELECTROLESS DEPOSITION OF TRANSITION METALS

Glenn O. Mallory, Jr., Los Angeles, and Conrad E. Johnson, Santa Ana, both of Calif., assignors to Richardson Chemical Company

Continuation of Ser. No. 690,822, Jan. 11, 1985, abandoned, which is a continuation of Ser. No. 479,108, Mar. 28, 1983, abandoned, which is a continuation of Ser. No. 283,872, Jul. 16, 1981, abandoned, which is a continuation of Ser. No. 173,909, Jul. 30, 1980, abandoned. This application Nov. 26, 1985, Ser. No. 802,078
Int. Cl.[4] C23C *18/38*
U.S. Cl. 106—1.23 **14 Claims**

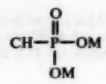
1. In a method for electrolessly depositing copper upon a substrate from a bath which includes in admixture: a source of copper cation, a reducing agent and a complexing agent, and which is characterized by said complexing agent rendering said bath operable through a wide range of pH values between about 4 and about 14, the pH value being selected to be the optimum value for the bath, for the substrate and for a selected one of a variety of reducing agents which is selected from the group consisting of formaldehyde, a hypophosphite compound, a boron-nitrogen compound, a borohydride, and an alkylamine borane, the improvement for electrolessly depositing copper at said wide range of pH values comprising:

including within the electroless copper bath an organophosphorus complexing agent selected from the group consisting of compounds having the general formulas:

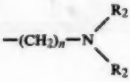


wherein R_1 is alkyl having from 1 to 5 carbon atoms, alkali metal and ammonium salts of said compounds, and

wherein R_2 is



R_3 is selected from the class consisting of R_2 and $—CH_2CH_2OH$, and R_4 is selected from the group consisting of R_2, $—CH_2CH_2OH$, and



wherein each M is independently selected from the group consisting of H, NH_4 and alkali metal, and "n" is an integer from 1 to 6 inclusive; and

immersing the substrate within the bath while operating the electroless copper deposition bath at said optimum pH value to maintain optimum deposition conditions for the substrate and for the selected reducing agent.

H326
Mn-Fe BASE AND Mn-Cr-Fe BASE AUSTENITIC ALLOYS

Howard R. Brager, and Francis A. Garner, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 612,771, May 22, 1984. This application Jun. 23, 1986, Ser. No. 878,501
Int. Cl.[4] C22C *38/04, 38/06, 38/38;* **G21B** *1/00*
U.S. Cl. 420—63 **46 Claims**

1. In elevated temperature, neutron irradiation environments encountered in a LMFBR core and a fusion reactor first wall, an alloy characterized by an austenitic microstructure, and said alloy consisting essentially of:

25 to 40 wt. % Mn;

5 to 15 wt. % Cr;

about 0.4 to about 3.0 wt. % Si;

an austenitic stabilizing element selected from the group consisting of C, and N, alone or in combination with each other, and in an amount effective to stabilize said austenitic microstructure, but less than about 0.7 wt. % C, and less than about 0.3 wt. % N;

up to about 0.1 wt. % P;

up to about 0.01 wt. % B;

up to about 3.0 wt. % Al;

up to about 0.5 wt. % Ni;

up to about 2.0 wt. % W;

up to about 1.0 wt. % Ti;

up to about 1.0 wt. % Ta;

up to about 2.5 wt. % V;

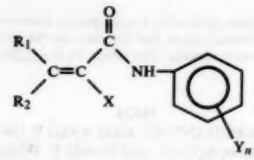
with the remainder being essential iron and wherein Mo and Nb, if present, are at most incidental impurities.

H327
NEMATICIDAL ALKENANILIDES

Carmine P. DiSanzo, and Clinton J. Peake, both of Medina, N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 349,421, Feb. 16, 1982, abandoned. This application Nov. 4, 1983, Ser. No. 549,215
Int. Cl.[4] C07C *103/60*
U.S. Cl. 564—207 **5 Claims**

1. A method for the control of nematodes by applying to the soil at the situs of infestation a nematicidally effective amount of a nematicidal composition containing as active ingredient a compound of the formula:



wherein R_1 and R_2 are indendently hydrogen, lower alkyl, or halogen;

X is hydrogen or halogen, with the proviso that at least one of R_1, R_2 and X must be halogen;

n is 1 or 2;

Y is hydrogen, lower alkyl, halogen, trifluoromethyl, lower alkoxy, lower alkylthio, and nitro when n is 1, and halogen when n is 2.

H328
PURIFICATION OF CEPHALOSPORINS

Hiroaki Koizumi; Satoru Kawatake, and Kanji Tokuyama, all of Osaka, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

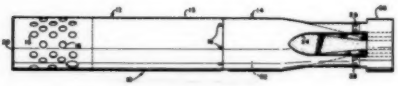
Filed Jan. 30, 1985, Ser. No. 696,430
Claims priority, application Japan, Feb. 2, 1984, 59-17699
Int. Cl.[4] C07D *265/12*
U.S. Cl. 544—90 **6 Claims**

1. A process for purifying oxacephalosporins which comprises contacting an aqueous solution of oxacephalosporin carboxylic acid (at pH lower than its pKa) with a macroporous polymeric adsorbent (specific gravity is higher than 1.05; and saturated adsorption capacity for cephalosporin C is larger than 60 mg/ml) to adsorb and thereby separate the oxacephalsporin carboxylic acid from non-adsorbable contaminants, and then eluting the adsorbed oxacephalosporin carboxylic acid with an aqueous hydrophilic organic solvent to elute and thereby separate the oxacephalosporin carboxylic acid from non-eluting contaminants.

H329
AERODYNAMIC HOUSING

Thomas Bahnck, Ottsville, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 30, 1982, Ser. No. 403,822
Int. Cl.[4] H04B *1/59;* **F42B** *25/00*
U.S. Cl. 367—3 **7 Claims**



1. An aerodynamic housing for a free-falling article, comprising:

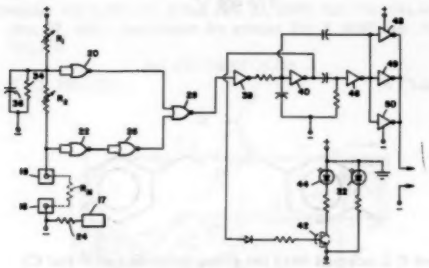
a cylindrical member adapted to contain the article at the forward end thereof and having a plurality of longitudinal channels located along the rearward end, said channels being radially equidistant and formed obliquely to the outer wall of said member to provide each channel with a leading edge in the shape of a truncated ellipse; and

a ring member mounted about the rearward end of said cylindrical member, said ring member being a continuous section of the outer wall of said cylindrical member to cover said channels aft of the leading edges thereof thereby forming recessed air ducts extending to the rearward end of said cylindrical member.

H330
PERSONNEL GROUNDING SYSTEM TESTER

Lawrence R. Burich, and Thomas O. Balcer, both of San Jose, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1984, Ser. No. 627,133
Int. Cl.[4] G01R 31/02; G08B 21/00; H02H 3/20
U.S. Cl. 324—500 8 Claims



1. Apparatus for testing a personnel grounding system of the type used to prevent the buildup of electrostatic charges on the body and clothing of a worker engaged in the handling of charge-sensitive electronic devices, said personnel grounding system including first connector means electrically coupled to the body of said worker and means for coupling said first connector means through a safety resistance to a grounding connector means, said grounding connector means being adapted to connected to a grounding terminal which is coupled to earth ground, said apparatus determining whether the resistance of said personnel grounding system, measured from said first connector means through the body of said worker to said grounding connector means, is between two preselected values and providing an indicating signal when the resistance of said personnel grounding system is between said two preselected values, said apparatus comprising:

(a) a voltage source having a first polarity and a second polarity;

(b) a test connector for receiving said grounding connector means, said first polarity of said voltage source being connected to said test connector;

(c) a first resistance, said first resistance being coupled to the second polarity of said voltage source;

(d) a conductive pad disposed so that it may be touched by said worker while being electrically coupled to said first connector means;

(e) a second resistance coupled between said first resistance and said conductive pad, said second resistance being less than the first resistance;

(f) first voltage sensing means coupled between said first and second resistances for providing a high output when a voltage at its input is above a selected voltage and low output when a voltage at its input is below said selected voltage;

(g) second voltage sensing means coupled between said second resistance and said conductive pad for providing a high output when a voltage at its input is above a selected voltage and a low output when a voltage at its input is below a selected voltage;

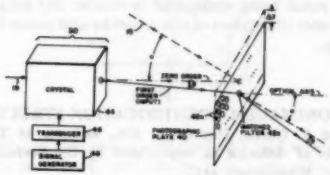
(h) means for providing an indicating signal when said first voltage sensing means provides a high output signal and said second voltage sensing means provides a low output signal; and

(i) the values of said first and second resistances being selected to provide a voltage at the input of said first voltage sensing means which is above said selected voltage and a voltage at the input of said second voltage sensing means which is below said selected voltage when the value of a resistance measured between said test connector and said conductive pad is between said two preselected values.

H331
LARGE MEMORY ACOUSTO-OPTICALLY ADDRESSED PATTERN RECOGNITION

Don A. Gregory; Joseph G. M. Duthie, and Laura L. Huckabee, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 1, 1985, Ser. No. 750,611
Int. Cl.[4] G06K 9/76
U.S. Cl. 382—31 2 Claims



1. A method of addressing the Fourier transform of stored optical images for optical pattern recognition comprising the steps of:

placing a transparent optical image in the path of a laser beam;

passing a laser beam along a predetermined path through the image for superimposing the image on the beam;

transforming the beam with the superimposed image by Fourier transformation;

spatially modulating the transformed optical images to deflect the images at selectable angles away from said predetermined path;

directing the transformed beam of optical images to a matched filter array for creating a resultant correlation light beam from the filter;

passing the created correlation light beam to the back focal plane of the array;

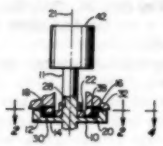
detecting the resultant correlation light beam at the back focal plane; and

displaying a diffracted light in the focal plane that indicates correlation between the transparent optical image and a corresponding reference image stored in said matched filter array.

H332
HIGH SPEED LOCK MECHANISM

Anthony P. Antonuzzi, Stoneham; William E. Hagel, Billerica; Donald M. Lawson, Lexington, all of Mass., and Richard S. Herman, Clifton, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 31, 1986, Ser. No. 859,100
Int. Cl.[4] F42C 15/06
U.S. Cl. 310—78 2 Claims



1. Apparatus for unlocking a trigger mechanism comprising,

an electrical motor mounted on a shaft, said shaft extending from said motor and having a ring coaxially mounted to rotate with said shaft,

means for activating said motor by electrical impulses to rotate said shaft 30° in either direction,

said wheel being located on said shaft adjacent a frame, a ball housing and a plurality of balls being disposed between the frame and wheel, said frame and wheel being spaced apart less than the diameter of said balls,

grooves in said frame to receive said balls to prevent relative rotation between the housing and the frame,

indentations in the wheel to receive the balls and allow said balls to drop from said grooves,

a notch in the periphery of said wheel,

a latch mounted adjacent the periphery of said wheel,

said notch being configured to receive said latch upon the proper orientation of said wheel by said means for activating.

H333
NONIMAGING IDENTIFICATION STRUCTURE

Richard A. Curtis, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 3, 1986, Ser. No. 881,369
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—608 **6 Claims**

1. Apparatus for nonimaging identification of a vehicle comprising:

a. a pulsed light source transmitter carried by said vehicle for emitting infrared radiation at a level which does not exceed the vehicle's infrared signature;

b. a receiver remotely located from said source to receive said infrared radiation;

c. first filter means carried by said pulsed light source transmitter for passing said infrared radiation at a predetermined frequency;

d. second filter means carried by said receiver for matching said wavelength of said passed infrared radiation;

e. detector means carried by said receiver for detecting said filtered infrared radiation and providing an output signal; and

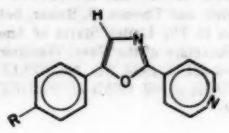
f. signal processing means carried by said receiver for receiving said output signal from said detector means and determining the identification of said detected filtered infrared radiation.

H334
OXAZOLE DYES

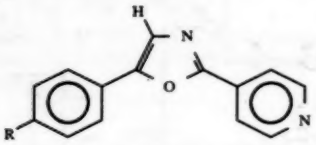
Ronald A. Henry, and Aaron N. Fletcher, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1986, Ser. No. 920,649
Int. Cl.[4] H01S *3/20*
U.S. Cl. 372—53 **4 Claims**

1. As a composition of matter, the compound having a formula as follows:



R = F and Cl

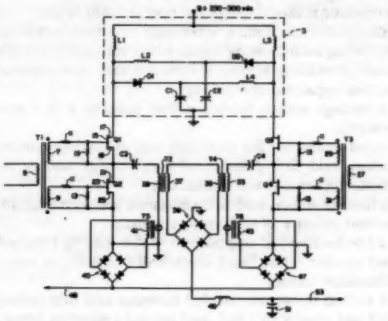


where R is selected from the group consisting of F and Cl.

H335
CONVERTER

Walter E. Milberger; Donald C. Lewns, both of Severna Park, and David E. Bulgher, Ellicott City, all of Md., assignors to The United States of America as respresented by the Secretary of the Army, Washington, D.C.

Filed Mar. 27, 1987, Ser. No. 32,406
Int. Cl.[4] H02N *3/335*
U.S. Cl. 363—16 **7 Claims**



1. An electrical power converter comprising; two current fed square wave choppers the phase relationships of which may be varied over 180 degrees to achieve output voltage control and regulation, means to drive one of said choppers by means of an amplified square wave clock signal and means to drive the other of said choppers with an amplified and variable-phase version of the said clock signal, means to combine the outputs of said choppers by means of two series-connected windings of two different transformers, the primaries of which are driven by said choppers, said series-connected windings being connected to a full-wave bridge rectifier which provides the converter output.

REISSUES

SEPTEMBER 1, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,486

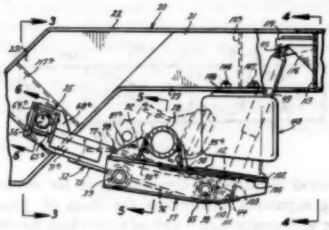
VEHICLE SUSPENSION WITH RIGID TORQUE BEAM

John E. Raidel, Jr., 2924 South Chantilly, Springfield, Mo. 65808

Original No. 4,427,213, dated Jan. 24, 1984, Ser. No. 341,445, Jan. 21, 1982. Application for reissue Jul. 8, 1987, Ser. No. 752,830

Int. Cl.[4] B60K *23/00*

U.S. Cl. 280—711 **16 Claims**



1. In a vehicle suspension assembly for a vehicle having a frame: a torque beam *having first and second ends* adapted to be secured to the vehicle frame at a first point; a spring also adapted to be secured to the vehicle frame at a second point spaced from the first point; a first resilient bushing having an outer sleeve adapted to be firmly secured *directly* to the frame; an inner sleeve, an elastomeric sleeve between the outer and inner sleeve; a pivot extending through the inner sleeve, and initially rotatable therein; the torque beam having spaced arms at its *first* end, one extending across each end of the inner sleeve, means for non-rotatably connecting the said arms to the pivot, so as to restrain rocking movement of the arms relatively to the inner sleeve; the torque beam arms extending from the first point toward the second point, and [converting] *converging* to a closer relation *at the second end*; means connecting the two arms to form a box-like torque beam; a buffer beam; [a second resilient bushing] *means* connecting the *second* end of the torque beam [near the second point] to the buffer beam [and another third resilient bushing connecting the two beams between the first and second points]; the spring being attached to the buffer beam beyond the torque beam, and means to connect the buffer beam [between its resilient bushings] to an axle housing.

Re. 32,487

BINOCULAR PRESENTATION OF VISUAL INFORMATION

Patrick G. Kalaugher, Exmouth, England, assignor to University of Exeter, Devon, England

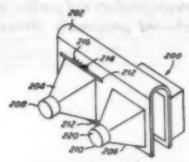
Original No. 4,521,074, dated Jun. 4, 1985, Ser. No. 457,515, Jan. 13, 1883. Application for reissue Jul. 16, 1986, Ser. No. 886,030

Claims priority, application United Kingdom, Jan. 22, 1982, 8201842

Int. Cl.[4] G02B *27/02*

U.S. Cl. 350—145 **6 Claims**

1. A method for presenting first and second images derived from respective different sources to respective ones of an observer's eyes so that they can be substantially mentally fused to be perceived as a single mental image, wherein the method comprises: prerecording a first image *of at least a portion of a scene* to serve as a first image source; selecting *said scene as* a second, different image source for a second image so that said first and second images have substantial but not complete equivalence in visual content; *and* presenting said first image to the observer's first eye while simultaneously presenting to the observer's second eye said second image under conditions such



that it matches the first image sufficiently for said substantial mental fusion to occur[; and subsequently interrupting the presentation of one of said images to a respective eye, the other image being visible to the other eye during said interruption; said interruption being effected externally of the observer].

Re. 32,488

HIP PROSTHESIS

Ramon B. Gustilo, and Richard F. Kyle, both of Hennepin County Medical Center - 701 Park Ave. South, Minneapolis, Minn. 55415

Original No. 4,546,501, dated Oct. 15, 1985, Ser. No. 426,092, Sep. 28, 1982. Application for reissue Sep. 12, 1986, Ser. No. 907,594

Int. Cl.[4] A61F *2/32*

U.S. Cl. 623—23 **14 Claims**

13. In a femoral insert for hip joint prosthesis having a spherical shaped head member, a neck member connected to the head member and terminating at a shaft member having a proximal portion connected to the neck member and extending approximately half the extent of the shaft member, and a distal portion extending therefrom, the improvement comprising:

the proximal portion having a longitudinal axis and a substantially straight aspect, an upper half which is broad in the medial-lateral direction and curved in the medial aspect and having a generally rectangular cross-section which is widest adjacent the neck member and gradually tapers to a generally square cross-section, and a lower half which has flat sides and a generally square cross-section of the upper half;

said neck member being anteverted with respect to the proximal portion at an angle of about 10° to 20° and is at an angle to

said longitudinal axis through said proximal portion of said shaft member of about 125° to about 140°;

at least one of the anterior and posterior sides of the upper half of said proximal portion including at least one porous bony ingrowth surface; and

said distal portion having the curved configuration of an intramedullary rod and curving in the opposite direction from the direction of said anteversion of said neck member, and said proximal portion extending straight in a plane parallel to said lateral aspect,

whereby firm fixation of the prosthesis is initially provided by the distal intramedullary rod portion while long term stabilization is achieved proximally through the bony ingrowth surface.

Re. 32,489

HERBICIDAL SUBSTITUTED 2-(1-(OXYAMINO)-ALKYLIDENE)-CYCLOHEXANE-1,3-DIONES

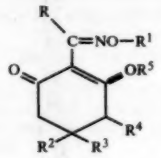
Tatao Luo, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Original No. 4,440,566, dated Apr. 3, 1984, Ser. No. 406,423, Aug. 9, 1982. Continuation-in-part of Ser. No. 405,228, Aug. 5, 1982, abandoned, which is a continuation of Ser. No. 210,206, Nov. 25, 1980, abandoned. Application for reissue Aug. 30, 1985, Ser. No. 771,086

Int. Cl.⁴ C07C *131/00*; A01N *31/06, 33/24*

U.S. Cl. 71—98 **47 Claims**

1. A compound of the formula



wherein

R is alkyl of 1 to 6 carbon atoms or phenyl;

R^1 is haloalkenyl of 2 to 6 carbon atoms and 1 to 3 halogen atoms, p-halobenzyl or p-trifluoromethylbenzyl;

R^2 and R^3 are independently hydrogen, alkyl of 1 to 3 carbon atoms, alkylthio of 1 to 6 carbon atoms, or alkylthioalkyl of 2 to 8 carbon atoms;

R^4 is hydrogen, or carbalkoxy of 2 to 4 carbon atoms;

R^5 is hydrogen, a cation, or

wherein R^6 is alkyl of 1 to 6 carbon atoms, phenyl or naphthyl.

34. The compound of claim 33 wherein R^1 is 3-transchloroallyl and R^5 is hydrogen.

Re. 32,490

METHOD OF MAKING A COMPOSITE LABEL WEB

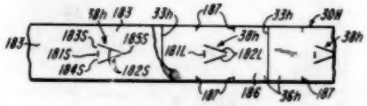
William A. Jenkins, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Original No. 4,081,309, dated Mar. 28, 1978, Ser. No. 715,812, Aug. 19, 1976. Division of Ser. No. 607,317, Aug. 25, 1975, which is a continuation-in-part of Ser. No. 475,728, Jun. 3, 1974, Pat. No. 3,948,172, and Ser. No. 475,730, Jun. 3, 1974, Pat. No. 3,941,289, each is a division of Ser. No. 366,919, Jun. 4, 1973, abandoned, which is a division of Ser. No. 206,061, Dec. 8, 1971, Pat. No. 3,783,083, which is a continuation-in-part of Ser. No. 155,740, Jun. 23, 1971, abandoned. Application for reissue Oct. 29, 1979, Ser. No. 88,802

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.⁴ B32B *3/16, 31/18*

U.S. Cl. 156—250 **24 Claims**



14. Method of making a composite web for use in a label dispensing apparatus, comprising the steps of: providing a composite web comprising a web of supporting material and a web of label material releasably secured to the supporting material web by pressure-sensitive adhesive, making a series of butt cuts in the label material web at longitudinally spaced-apart locations to provide a series of pressure-sensitive labels on the supporting material web, and making a series of flap-forming cuts through the supporting material web and at least partially through the label material web between the marginal side edges of the composite web at longitudinally spaced-apart locations to provide *a series of* flap portions in the supporting material web, *all of the flap portions within the supporting material web projecting in the same direction,* the [supporting material] *composite* web being wound into a roll in a direction that *all of* the flap portions extend *only* in a trailing direction away from the outer free end of the [supporting material] *composite* web.

Re. 32,491

PROCESS FOR THE PREPARATION OF 7α-METHOXY-7β-(1,3-DIETHIETANE-2-CARBOXYAMIDO)CEPHALOSPORANIC ACID DERIVATIVES

Masaru Iwanami, Yokohama; Tetsuya Maeda, Urawa; Yoshinobu Nagano, Niiza; Masaharu Fujimoto, Tokyo; Noriaki Nagano, Ageo, and Atsuki Yamazaki, Ichikawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

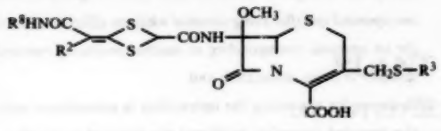
Original No. 4,404,373, dated Sep. 13, 1983, Ser. No. 208,298, Nov. 19, 1980. Division of Ser. No. 913,500, Jun. 7, 1978, Pat. No. 4,263,432. Application for reissue Apr. 25, 1985, Ser. No. 727,233

Claims priority, application Japan, Jun. 10, 1977, 52-68699; Jul. 28, 1977, 52-90772; Feb. 2, 1978, 53-10772

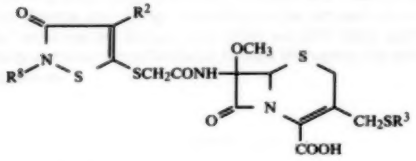
Int. Cl.⁴ C07D *501/57*; A61K *31/54*

U.S. Cl. 540—221 **7 Claims**

1. A process for the preparation of a 7α-methoxy-7β-(4-substituted methylene-1,3-[dithientane]*dithietane*-2-yl) carboxamido-3-heterocyclic thiomethyl-Δ^3-cephem-4-carboxylic acid represented by the formula



wherein R^2 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, $R^4S(O)_n$ group wherein R^4 represents a lower alkyl gorup and n represents 0, 1 or 2, a lower alkanoyl group, a phenyl group, a naphthyl group, a benzoyl group, a naphthoyl group, *a carboxyl group, a derivative thereof selected from the group consisting of lower alkyl, phenyl lower alkyl and naphthyl lower alkyl esters of said carboxyl group and carbamoyl, carbazolyl and cyano groups,* a lower alkenyl group a sulfamoyl group, or a pyridyl group, or a thiadiazolyl group, and R^3 represents a lower alkyl-substituted tetrazolyl group or a lower alkyl-substituted thiadiazolyl group, and R^8 represents a hydrogen atom or an alkyl group [which may have substituents selected from N-monoalkyl carbamoyl, N-dialkyl carbamoyl, and alkoxy carbonyl amino], which comprises treating the 7α-methoxy-3-heterocyclic thiomethylcephalosporin derivatives represented by the formula



wherein R^2, R^3 and R^8 have the same significance as above, with a base.

Re. 32,492

SOLID-STATE COLOR TELEVISION CAMERA DEVICE

Yasuo Takemura, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Original No. 4,460,919, dated Jul. 17, 1984, Ser. No. 380,145, May 20, 1982. Application for reissue Jun. 26, 1986, Ser. No. 878,631

Claims priority, application Japan, Jun. 10, 1981, 56-88248

Int. Cl.[4] H04N 9/07

U.S. Cl. 358—44 **14 Claims**

12. A solid-state color television camera device comprising:

a semiconductor substrate;

a photosensor array, formed on the substrate, having a plurality of photosensors arranged in horizontal and vertical rows, each photosensor generating a charge upon receipt of an image;

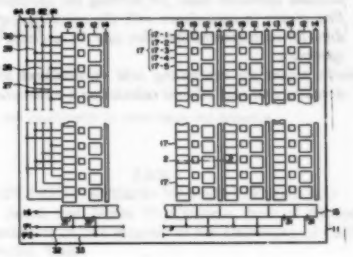
a vertical transfer means, positioned adjacent each vertical row of photosensors and responsive to vertical transfer signals, for receiving the charges generated by the adjacent photosensors and transferring the charges to a horizontal transfer means;

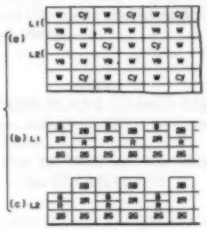
a charge mixing means, coupled to said vertical transfer means, for mixing the charges generated by the photosensors in two adjacent horizontal rows;

a horizontal transfer means, positioned adjacent one end of each vertical row of photosensors for receiving the charges transferred by the vertical transfer means, and transferring them as an output signal to an output terminal formed on the substrate;

a color filter array having a plurality of separate filter elements arranged in horizontal and vertical rows, each of said elements corresponding to a respective photosensor;

said color filter array, comprising a plurality of unit filter arrays, each unit consisting of 2×4 filter elements of yellow





(Ye), green (G), cyan (Cy) or white (W) colors and including at least one element of the yellow (Ye) and cyan (Cy) colors.

Re. 32,493

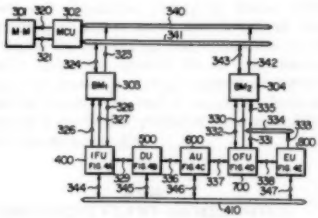
DATA PROCESSING UNIT WITH PIPELINED OPERANDS

Hideaki Matsumoto; Tadaaki Bandoh, and Hideo Maejima, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,454,578, dated Jun. 12, 1984, Ser. No. 265,168, May 19, 1981. Application for reissue Jun. 11, 1986, Ser. No. 873,174

Int. Cl.[4] G06F 9/42, 9/34, 9/36

U.S. Cl. 364—200 **23 Claims**



18. A data processing unit for executing variable length instructions in which operand specifiers for specifying addressing modes of operands are independent from operation codes for ascertaining operations, comprising:

first means for storing data including variable length instructions and certain of the operands to be executed by certain of the instructions;

second means for prefetching an instruction from said first means, for retaining the prefetched instruction, and for aligning a predetermined sequence of elements of the instruction including at least one operand specifier;

third means for decoding an operation code and each operand

specifier of an aligned instruction received from said second means, for calculating the effective address for the operand specified by each operand specifier in accordance with the decoded operation code, for fetching the operand from said first means in accordance with the calculated effective address for each operand specifier, and for retaining the fetched operands;

fourth means for controlling said third means so that said decoding and said address calculating are executed independently and at different times for each operand specifier, with one operand specifier being decoded while an effective address for an operand corresponding to another preceding operand specifier is being calculated; and

fifth means for executing the instruction in accordance with the decoded operation code and the retained operand.

PLANT PATENTS

GRANTED SEPTEMBER 1, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,998

HYBRID SHRUB ROSE PLANT CV. AROPICLU

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Somis, Calif.

Filed Sep. 9, 1985, Ser. No. 773,660
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—1 **1 Claim**

1. The new and distinct variety of hybrid shrub rose plant cv. Aropiclu and the parts thereof, substantially as shown and described herein, the plant being particularly characterized by its unusual open flower form, essentially as described and illustrated herein; its extremely abundant production of flowers in very large pyramidal clusters; its female sterility and well-above-average disease resistance; its semi-pendulous branching habit, yielding a large, well-filled and rounded bush with flowers and foliage extending to the ground; its very narrow, elongated foliage with highly serrated edges; and its nearly continuous production of flowers throughout the growing season.

5,999

ROSE PLANT NAMED SAVAPEG

Peggy L. Utz, New Albany, Ind., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Oct. 2, 1985, Ser. No. 783,115
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, which is a sport of the miniature rose "Starina" producing exhibition form flowers of varying pale rose tonality that hold color well through development and aging.

6,000

HYBRID TEA ROSE PLANT CV. AROLICAL

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Somis, Calif.

Filed Sep. 9, 1985, Ser. No. 773,661
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. The new and distinct variety of hybrid tea rose plant cv. Arolical and the parts thereof, substantially as shown and described herein, the plant being particularly characterized by its abundant production of large blooms of a pleasing, uniform medium-lavender coloration; its heavy, sweet citrus-blossom fragrance; its medium height and abundant, relatively large foliage; and its above-average vigor and bloom production, especially as compared to other cultivars of similar coloration.

6,001

GRAPEFRUIT HYBRID NAMED MELOGOLD

Robert K. Soost, and James W. Cameron, both of Riverside, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Nov. 12, 1985, Ser. No. 797,286
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—45 **1 Claim**

1. The new and distinct variety of grapefruit hybrid plant herein described and illustrated and identified by the characteristics enumerated above.

6,002

IMPATIENS PLANT NAMED CIRRUS

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 10, 1985, Ser. No. 786,073
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens named Cirrus, as described and illustrated, and particularly characterized by the combined features of relatively early flowering, white flowers with five petals in which the upper petal has a green blotch showing through; vigorous and highly self-branching growth habit; green stems carrying relatively long and broad green leaves having uniform greenish yellow variegation; excellent flower keeping qualities, and ideal suitability for hanging baskets.

6,003

ASIATIC LILY PLANT NAMED 'TRIBUTE'

Edward A. McRae, Boring, Oreg., assignor to Melridge Inc., Gresham, Oreg.

Filed Sep. 3, 1985, Ser. No. 772,158
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive variety of Asiatic hybrid lily plant, substantially as herein shown and described, characterized in particular by the orange-red coloration of its large sized, virtually unspotted flowers, by its high tolerance of virus, its vigorous growth and rapid natural propagation, the excellence of its flower form, and its versatility both as a garden plant and as a cut flower producer from precooled bulbs forced out-of-season under glass.

6,004

IMPATIENS PLANT NAMED NOVA

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 10, 1985, Ser. No. 786,127
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens named Nova, as described and illustrated, and particularly characterized by the combined features of bright orange red flower color; relatively large flowers, two of which occur at each leaf axil; vigorous and superior self-branching habits; leaf variegation pattern and color, and relatively early flowering.

PATENTS

GRANTED SEP. 1, 1987

ERRATA

For CLASS	See PATENT NO.
060-228	4,689,845
437-044	4,689,869
437-040	4,689,871
437-228	4,689,872
437-002	4,689,873
437-002	4,689,874
437-211	4,689,875
187-101	4,690,243
254-327	4,690,376
439-013	4,690,470
439-063	4,690,471
439-067	4,690,472
439-001	4,690,473
439-120	4,690,474
439-502	4,690,475
439-502	4,690,476
439-595	4,690,477
439-271	4,690,478
439-097	4,690,479
439-364	4,690,480
439-585	4,690,481
439-578	4,690,482
439-517	4,690,483
439-736	4,690,484
437-208	4,690,714
437-022	4,690,717
435-161	4,690,903

PATENTS

GRANTED SEPT. 1, 1887

PATENTS

GRANTED SEPTEMBER 1, 1987

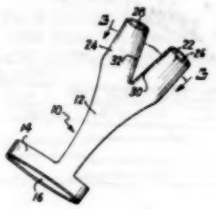
GENERAL AND MECHANICAL

4,689,828

PROTECTIVE DEVICE FOR HAIR STYLIST'S FINGERS

Janet C. Brewer, 506 Clay St., La Porte, Ind. 46350

Filed Jan. 2, 1987, Ser. No. 67
Int. Cl.[4] A41D *45/10*
U.S. Cl. 2—21 **11 Claims**



1. A finger protector for hair stylist's fingers useful to protect the index finger and second finger of one hand from being pierced and cut by scissors which are used in the other hand during the cutting and styling of hair, comprising:

an open ended two finger body having a lower open end portion, a web portion between the two fingers and an upper open end portion which extends from said lower end portion to cover the first knuckles of the index and second fingers;

said unitary two-fingered body portion being thickened on the inside for the index finger and the second finger; and

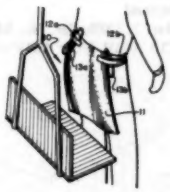
said web portion between the index finger and the second finger separating these fingers at an angle between about 25° to about 35° to facilitate pulling said body over the index and second fingers over the knuckles and into the web between the two fingers in the palm area while permitting the remaining fingers and the thumb to curl below the index finger and second finger and to be completely exposed when the hair stylist grasps the tips of the hair for cutting.

4,689,829

SEAT CONVERING DEVICE FOR SKIERS

Robert M. Kaplan, 5546 E. Sanna, Paradise Valley, Ariz. 85253

Filed Nov. 26, 1986, Ser. No. 935,018
Int. Cl.[4] A41D *27/12*
U.S. Cl. 2—46 **3 Claims**



1. A seat covering device for skiers comprising:

an elongated flap having a width and length sufficient to cover the seat of a skier,

said flap being formed of a supple, lightweight, waterproof material for rolling up and unrolling along its length,

belt means secured to one end of said flap and extending laterally thereof for fastening around the waist of a skier, and

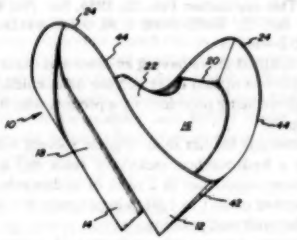
a pair of loops formed of elastic material mounted on said one end of said flap, one at each side thereof for surrounding the flap when it is rolled up along its length to said belt and releasing the rolled up flap when the loops are moved laterally of the ends of the rolled up flap to cause it to extend downward under the action of gravity over the seat of the skier.

4,689,830

HAIR CUTTING CAPE WITH CATCH FOR HAIR CLIPPINGS

Mary Williams, 148 East Hunter St., Glens Falls, N.Y. 12801

Filed Apr. 24, 1986, Ser. No. 855,391
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—50 **7 Claims**



1. A haircutting cape comprising:

a piece of flexible material adapted to be disposed about the head and shoulders of the user, said cape having a shield portion consisting of a front panel and a rear panel to cover the user;

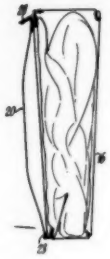
and a catch downward of the shield portion for receiving hair clippings, said catch comprising a front receptacle and a rear receptacle.

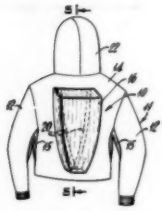
4,689,831

CONVERTIBLE GARMENT

Susan Greenberger, and Kate B. Horwich, both of Westport, Conn., assignors to Homebodies, Inc., Westport, Conn.

Filed Jun. 27, 1986, Ser. No. 879,452
Int. Cl.[4] A41B *1/00*
U.S. Cl. 2—93 **10 Claims**





1. A convertible garment comprising a garment and a pocket on a side of the garment, the pocket being invertible such that the garment may be folded therein, thereby forming a carrying bag adapted to be worn on an individual's back.

4,689,832

PARTIALLY DETACKIFIED LEATHER AND GLOVE

Lewis W. Mulvaney, Ho-Ho-Kus, N.J., assignor to R. Neumann & Co., Hoboken, N.J.

Division of Ser. No. 671,761, Nov. 14, 1984, Pat. No. 4,598,429. This application Feb. 25, 1986, Ser. No. 832,751
Int. Cl.[4] B05D *1/18, 1/36, 3/02*; A41D *19/02*
U.S. Cl. 2—161 A **6 Claims**

1. A tackified glove having an inner and outer surface and at least a portion of said inner surface detackified,

said glove being produced by a process which comprises the steps of:

a. immersing leather in an organic solvent solution containing a hydrocarbon tackifying resin and an isobutylene-butene copolymer in a ratio of hydrocarbon resin to copolymer of 10:1 to 1:10 to impregnate the leather on both sides with said solution,

b. evaporating the solvent from said impregnated leather sheet to thereby tackify both sides of said leather,

c. detackifying at least a portion of the inner side of said leather by applying thereto an organic solvent solution containing nitrocellulose and a silicone resin in a ratio of silicone resin to nitrocellulose of 1:30 to 1:10,

d. evaporating the solvent from the leather of step c. and

e. sewing the leather into a glove,

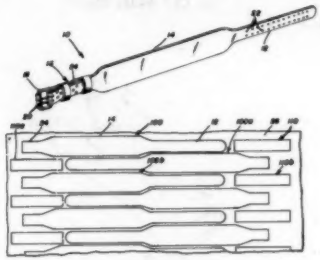
wherein the outer side is tackified and the inner side is detackified, but yet retains the feel of leather.

4,689,833

WEIGHT LIFTING BELT

Jerry Daniels, 4308 Ooltewah-Ringgold Rd., Ooltewah, Tenn. 37363

Filed Mar. 17, 1986, Ser. No. 840,132
Int. Cl.[4] A41F *9/00*; A61F *5/24*
U.S. Cl. 2—322 **10 Claims**



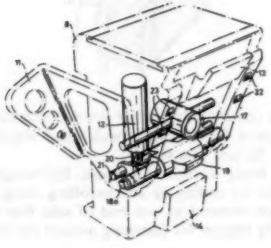
1. A weight lifting belt comprising a pair of strips of natural leather, one of said strips being longitudinally elongated and having a central portion intermediate first and second end portions, said central portion having a larger width relative to both end portions, said central portion and a first of said end portions being substantially elongated longitudinally relative to the second end portion, the other strip of said pair of strips comprising a short strip relative to said one strip and having substantially the same width as said second end portion, a fold formed in said other strip so that terminal ends thereof are substantially adjacent end other and a surface of said other strip forms superposed opposed surfaces, a buckle entrapped intermediate said opposed surfaces at said fold, and connecting means for fixedly securing said second end portion to said other strip remote from said buckle, said buckle and said first end portion having cooperating fastening means for adjustably attaching said buckle to said first end portion, one terminal end portion of said other strip being offset from the other terminal end portion relative to said fold, and said second end portion is in abutment and secured to one surface of said opposed surfaces, said one surface being adjacent the terminal end most remote from said fold.

4,689,834

NIGHT VISION GOGGLE ARRANGEMENT WITH AUTOMATIC RELEASE

Brian D. McCarthy, and Michael Edwards, both of MS Instruments Limited, Electron House, 33-49 Farwig Lane, Bromley, Kent BR1 3RE, England

Filed Mar. 7, 1986, Ser. No. 837,154
Int. Cl.[4] A42B *3/00*; A61F *9/02*
U.S. Cl. 2—422 **7 Claims**



1. A night vision goggle arrangement for a helmet, comprising

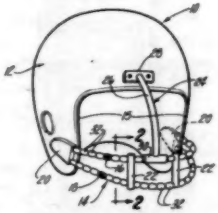
(a) an adjustable assembly connected with the goggles for adjusting the position of the goggles relative to a user;
(b) means for connecting said assembly with a mounting plate on the helmet;
(c) means for locking said assembly to the helmet mounting plate;
(d) means for releasing said assembly from the helmet mounting plate; and
(e) stored energy means for disengaging and ejecting said assembly from the helmet mounting plate.

4,689,835

FACE GUARD DESIGN

Howard J. Draft, 1050 Helen La., Madison Heights, Mich. 48071, and Robert W. Chambers, 3540 Greentree Rd., Bloomfield Hills, Mich. 48013

Filed Nov. 2, 1981, Ser. No. 317,498
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—424 **10 Claims**



1. In an athletic helmet having a face opening and a face guard assembly located across the face opening, said face guard assembly comprising: at least one bar member extending generally across the face opening and a plurality of rollers rotatably supported on said bar member whereby manual gripping of the face guard assembly is inhibited, at least two of said rollers being located adjacent each other on said bar member with no intervening non-rotatable element in between.

4,689,836

HEADGEAR FOR MOTORCYCLING AND SIMILAR ACTIVITIES, WITH A MOVABLE VISOR AND CHIN GUARD

Alberto Vitaloni, Turin, Italy, assignor to Vitaloni Group S.p.A., Turin, Italy

Filed Jul. 14, 1986, Ser. No. 885,151
Claims priority, application Italy, Nov. 5, 1985, 54002/85[U]
Int. Cl.[4] A42B *1/08*
U.S. Cl. 2—424 **15 Claims**

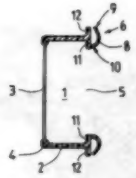
1. Headgear for motorcycling and like activities, comprising a protective helmet, a visor and a chin guard, both said visor and said chin-guard being substantially C-shaped in plan so as to have lateral arms which are fixed to the sides of the helmet by respective hinge means which allow the visor to be moved between a lowered position in front of the upper part of the face and a raised position on the forehead and the chin guard adapted to be moved by the hand of a wearer and independently of the chin between a raised position in front of the lower part of the face and a lowered position beneath the chin, the arms of the visor and of the chin guard being interconnected in correspondence with their respective hinge means by operating means such that the lowering of one of the visor and chin guard causes the concomitant raising of the other and vice versa and means for maintaining the visor and the chin guard in their respective raised and lowered positions.

4,689,837

EYE SHIELD WITH FACE ENGAGING SEAL

Robert Bollé, Oyonnax, France, assignor to Etablissements Bolle Georges, Robert et Maurice, Oyonnax, France

Filed May 21, 1985, Ser. No. 736,326
Claims priority, application France, May 21, 1985, 84 07851
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—440 **7 Claims**



1. A mask to be placed flush against a wearer's face, said mask comprising:
a visor and a lateral frame which define an interior space,
said lateral frame extends between said visor and the wearer's face essentially perpendicular to the wearer's face to space away the wearer's face from said visor a distance substantially equal to a length of said lateral frame, said lateral frame including flexible bearing means by which said mask bears on the wearer's face, said flexible bearing means comprises two flexible rims respectively extending from said lateral frame in a symmetrical arrangement towards the interior space and away from the interior space, said two flexible rims extending in a direction transverse to said lateral frame,
a cushion mounted on one of said flexible rims, extending in a cantilever manner from said one flexible rim towards the other flexible rim, and being curved towards said other flexible rim,
so that when said visor is impacted, said cushion will in a first position deform to absorb the impact and under sufficient force will in a second position transmit pressure to at least one of said two flexible rims, which will also deform to absorb such pressure, thereby providing a two position deformation while spacing said lateral frame and said visor from the wearer's face to avoid impacting the wearer's face with said visor.

4,689,838

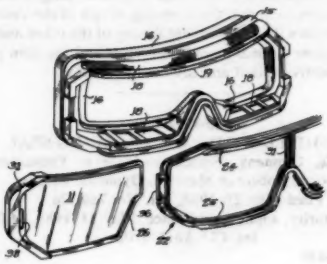
GOGGLES WITH INTERCHANGEABLE LENSES

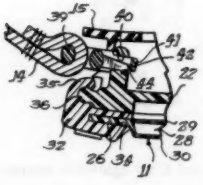
Gottfried Angermann, Neuhofen, and Berthold Hiebl, Traun, both of Austria, assignors to Optyl Eyewear Fashion International Corporation, Norwood, N.J.

Filed Feb. 20, 1986, Ser. No. 831,408
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3506079
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—441 **5 Claims**

1. Goggles comprising flexible frame means deformable to conform to and seal about the wearer's face and eyes; strap

means secured to the goggles adjacent the temple for securing the goggles to the wearer's head; rigid frame means secured to the periphery of the flexible frame means and having a beaded edge, and a channel means adjacent the upper and lower edges of the flexible frame means, the channel means having an opening adjacent the temple area of the flexible frame means; removable lens means including a peripheral flange receivable





within the opening of the channel means so that the lens means are slidable within the channel means to locate the lens means with respect to the rigid frame means; and rigid gripping means secured to the temple portion of the lens means operable to close the opening of the channel means and including locking clip means which snaps over the beaded edge of the rigid frame means to removably secure the lens means within the channel means.

4,689,839

TAP WATER POWERED HYDROTHERAPY METHOD AND APPARATUS

Melvyn L. Henkin, 5011 Donna Ave., Tarzana, Calif. 91356, and Jordan M. Laby, 3038 Bayshore, Ventura, Calif. 93001

Continuation-in-part of Ser. No. 796,987, Nov. 12, 1985, and Ser. No. 843,151, Mar. 24, 1986. This application Aug. 29, 1986, Ser. No. 902,179

Int. Cl.[4] A61H *33/02*

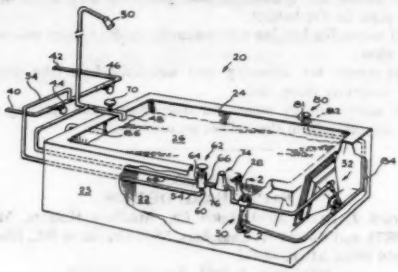
U.S. Cl. 4—542 **55 Claims**

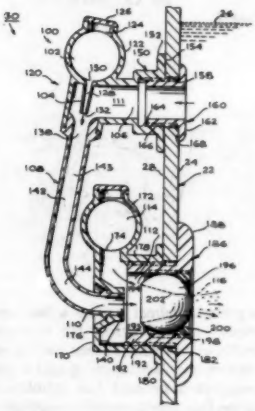
1. In combination with a tap water source means supplying a pressurized fresh water flow, hydrotherapy apparatus operable with an electrically driven pump for discharging a water stream for massaging a user's body, said apparatus comprising:

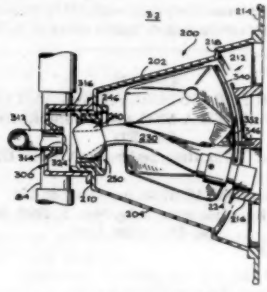
a tub having a peripheral wall for containing a water pool;

a discharge means for discharging a water stream into said pool;

means mounting said discharge means proximate to an area of said peripheral wall for movement along a path extending substantially perpendicular to said stream; and







means responsive to said pressurized fresh water flow for moving said discharge means along said path.

4,689,840

BUILT-IN SINK

Manfred Mück, Kürnbach; Walter Blanc, Oberderdingen, and Hans-Albert Müller, Schwabach, all of Fed. Rep. of Germany, assignors to Blanc GmbH & Company, Fed. Rep. of Germany

Continuation of Ser. No. 711,958, Mar. 14, 1985, abandoned. This application Jun. 16, 1986, Ser. No. 874,694

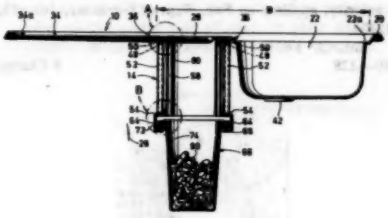
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410103; Jan. 17, 1985, 3501443

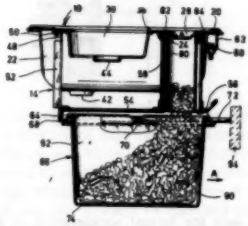
Int. Cl.[4] E03C *1/00*

U.S. Cl. 4—629 **32 Claims**

1. A built-in sink unit comprising a built-in sink with a shaped plate within which a sink basin and beside the same a waste disposal opening are provided, said unit having a drop shaft extending downwardly from the shaped plate and encom-

passing the waste disposal opening and holding means for carrying a waste container beneath said drop shaft, said waste container having an upper opening larger in cross-sectional area than the cross-sectional area of the drop shaft, said upper opening having a front and rear end relative to the position of the built-in sink said holding means comprising guide means mounting the waste container for horizontal sliding movement transversely to the longitudinal direction of the built-in sink





along a path of movement extending between a rear and a front end position, relative to the position of the built-in sink in which the waste container is located in front of the built-in sink, whereas in the rear end position of the waste container the drop shaft is located above an area of the upper opening of the waste container being spaced from the rear end of said upper opening.

4,689,841

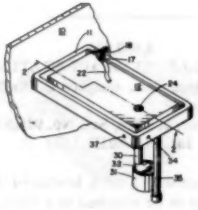
FOLDAWAY SINK

Gregory M. Owen, 2919 E. Elm Cir., Katy, Tex. 77449

Filed Oct. 2, 1986, Ser. No. 914,271

Int. Cl.[4] E03C *1/322*

U.S. Cl. 4—644 **10 Claims**



1. A foldaway sink comprised of an elongated sink member having a substantially flat central surface, said sink member having a generally rectangular configuration with four side surfaces,

means on one of said side surfaces for pivotally coupling said one side surface to a vertical base member,

means defining a drain opening in said central surface and including threaded coupling means disposed below said central surface for attaching a drain pipe,

a tubular drain pipe with means for releasably attaching to said threaded coupling means,

first attachment means on said drain pipe and on a side surface of said sink for attachment of said drain pipe to said side surface when said sink is pivoted to a non-use position,

means defining a blind opening on the bottom surface of said sink member for releasably receiving a support pipe,

a tubular support pipe receivable in said opening, said support pipe having a second attachment means thereon adapted to cooperate with a second attachment means on a side surface of said sink for attachment of said support pipe to said side surface when said sink is pivoted to said non-use position.

4,689,842

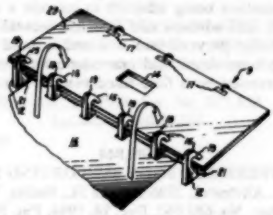
PATIENT MOTIVATION DEVICE

George C. Kuhn, 228 E. Commercial St., East Rochester, N.Y. 14445

Filed Nov. 26, 1986, Ser. No. 935,016

Int. Cl.[4] A61G *7/10, 7/02*

U.S. Cl. 5—61 **6 Claims**



1. A device for assisting attendants in moving bedridden patients for their excretory functions comprising:

(1) a substantially rigid rectangular platform for supporting a patient thereon, said platform including an opening therein so located that waste excreted by said patient falls into waste collector underneath said opening without touching said platform, and

(2) a plurality of substantially rigid vertical supports formed on the underside of said platform for supporting said platform at a predetermined distance above the surface on which said patient is reposed, each of said vertical supports including a resilient member thereon said resilient member extending from said vertical support outwardly and around one of the longer edges of said platform,

whereby said resilient member is initially compressed by contact with the patient as the patient is moved from a place of repose over to and on to said platform edge thereby tilting said platform and as said patient is fully moved on to said platform, said resilient member is released from compression to return to its original state thereby allowing said platform to return to its original position supported by said rigid vertical supports.

4,689,843

DECORATIVE COVER FOR A FLOATATION SLEEP SYSTEM

Philip J. Santo, 12 Mountin Rd., Rochester, N.Y. 14625

Filed Sep. 2, 1986, Ser. No. 902,776

Int. Cl.[4] A47C *27/08*

U.S. Cl. 5—452 **4 Claims**

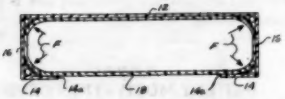
1. For use with a floatation sleep system including a fluid-filled bladder, a decorative cover adapted to contain a fluid-filled bladder and functional to maintain a substantially rectilinear shape for such fluid-filled bladder, said cover comprising:

a first flexible, substantially rectangular, dimensionally stable sheet;

a second flexible, substantially rectangular, dimensionally stable sheet, said second sheet having an opening defined therein and adapted to have a floatation sleep system bladder inserted therethrough;

means for interconnecting the marginal perimeter edges of said first and second sheets; and

a first dimensionally stable tie member joining said first sheet to said interconnecting means and disposed interiorly of the interconnection of said first sheet and said interconnecting means, and a second dimensionally stable tie member joining said second sheet and said interconnecting



means and disposed interiorly of the interconnection of said second sheet and said interconnecting means, whereby said first and second tie members respectively form first and second chambers with said first and second sheets and said interconnecting means, said first and second chambers being adapted to contain a compressible medium, and wherein said first and second tie members respectively prevent said first and second sheets from moving away from said interconnecting. means due to forces exerted by a fluid-filled bladder contained therewithin.

4,689,844

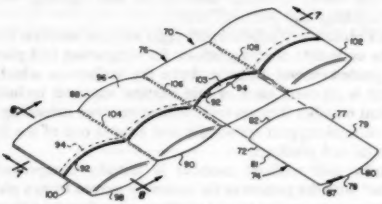
CONVERTIBLE BODY SUPPORTING PADS

Margaret A. Alivizatos, 3745 Purdue St., Dallas, Tex. 75225

Division of Ser. No. 683,067, Dec. 18, 1984, Pat. No. 4,606,087, which is a continuation-in-part of Ser. No. 650,800, Sep. 14, 1984, Pat. No. 4,607,403. This application Apr. 29, 1986, Ser. No. 857,731

Int. Cl.[4] A47C *27/14*; A61G *7/04*

U.S. Cl. 5—455 **7 Claims**



1. A convertible support pad useful at least as a mattress or lounging support comprising:

a plurality of cushions comprising flexible drainable fabric top and bottom panels of generally rectangular configuration which are each closed to form an enclosed space, said space being at least partially filled with a flowable expanded foam bead fill material for conforming to a body or limb supported by said cushions and for distributing support forces therein, and

a segmented flexible drainable fabric cover forming a plurality of side by side pockets for receiving said cushions, respectively, said pockets being formed between laterally extending hinge lines formed in said segmented cover by securing opposed panels of said segmented cover to each other along said hinge lines, and means for inserting and removing cushions comprising marginal edges of the cover material that forms one of said opposed panels, said means extending along said one opposed panel, said marginal edges being secured together with the other opposed panel at the hinge lines, said marginal edges being separable for insertion and removal of respective cushions from their respective pockets.

4,689,845

IMPULSE PROPULSION UNIT

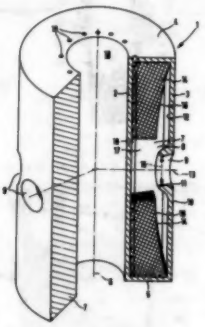
Lothar Stessen, Lauf, Fed. Rep. of Germany, assignor to DIEHL GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed May 21, 1986, Ser. No. 867,217

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521204

Int. Cl.[4] F02K *1/00, 9/00*; C06D *5/00*

U.S. Cl. 60—228 **9 Claims**



1. An impulse unit for lateral acceleration of a projectile comprising:

a housing dispersed about a longitudinal axis having annular end walls and inner and outer cylindrical walls radially spaced from each other and extending between said end walls, thereby defining an annular, elongated space enclosed by said walls;

a plurality of nozzles disposed on an outer surface of said outer wall, each nozzle adapted to communicate with a propellant chamber disposed in said annular space;

a plurality of separating walls radially extending between said inner and outer cylindrical walls to separate adjacent propellant chambers from one another and thereby dividing said annular space between the outer and inner cylindrical walls into a plurality of axially elongated segments circumfertentially adjacent one another and separate from one another.

4,689,846

DOCK LEVELER APPARATUS

Danny Sherrod, Joshua, Tex., assignor to Bluff Welding Inc., Burleson, Tex.

Filed Nov. 3, 1986, Ser. No. 926,634

Int. Cl.[4] E01D *1/00*

U.S. Cl. 14—71.3 **7 Claims**

1. Apparatus for use with a dock leveler of the type having a base means adapted to be attached to a dock, a bridge plate having a first edge pivotally coupled to an edge of said base means for pivotal movement in rearward and forward directions between a forward extended position and a rearward position, stop means coupled to said base means to be engaged by said bridge plate when said bridge plate is in its forward extended position for preventing said bridge plate from pivoting in a forward direction beyond said forward extended position, a lip plate pivotally coupled to an edge portion of said bridge plate opposite said first edge for pivotal movement between an extended position generally forming an extension of said bridge plate and a folded position wherein said lip plate

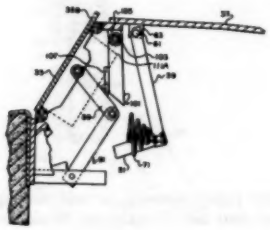
forms an acute angle with said bridge plate, said apparatus comprising:

first and second linkage means having first ends respectively pivotally coupled together,

the other end of said first linkage means being adapted to be pivotally coupled to the underside of said bridge plate,

the other end of said second linkage means being adapted to be pivotally coupled to said base means for pivotal movement about a pivot axis that is to be fixed relative to said base means,

catch means having a first end adapted to be pivotally coupled to the under side of said lip plate and a free end adapted to hang downward from said lip plate,



said catch means having an engaging means adapted to engage structure of said first linkage means when said bridge plate is moved to its rearward position for holding the free end of said lip plate away from and forward of said bridge plate as said bridge plate is moved from its rearward position toward its forward extended position for allowing said lip plate to engage the bed or the like of a vehicle,

said engaging means of said catch means being adapted to be disengaged from said structure of said first linkage means when said bridge plate reaches a given position as it moves toward its forward extended position.

4,689,847

BALL UNIT

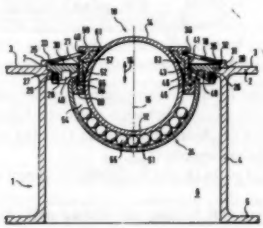
Thomas Huber, Iffeldorf, Fed. Rep. of Germany, assignor to Electro-Pneumatic-International GmbH, Hausham, Fed. Rep. of Germany

Filed Mar. 6, 1986, Ser. No. 836,943

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507945

Int. Cl.[4] B60B *33/08*

U.S. Cl. 16—26 **14 Claims**



1. Ball transfer unit, in particular for conveying devices such as for example ball mats, and having a load ball which by a part of its surface can bear against a first body, in particular against a load object to be displaced by way of the conveying device; said ball unit comprising:

a bearing unit which bears the load ball to be freely rotatable and to a large extent so encloses it that a free part of the surface of the load ball projects out of the bearing unit through a circular passage opening to bear against the first body,

a holder which, for the fastening of the ball unit at a second body, in particular at the carrying frame of a conveying device, has a fastening portion which in the assembled state bears against the second body, wherein the bearing unit is so movable to and fro linearly relative to the holder between an advanced and a withdrawn end position that the free surface of the load ball in the advanced end position projects further beyond a surface of the second body than in the withdrawn end position, and

spring means including a spring which is stressed between the bearing unit and holder, is arranged concentrically with the passage opening of the bearing unit as seen in the direction of the linear movement of the bearing unit and which biases the bearing unit into the advanced end position, said spring (**18**) being constructed as a flatly bowed annular disk and being supported at the holder (**20**) in immediate proximity of said fastening portion (**31**), said disk being bowed to conform generally to a sphere or truncated cone.

4,689,848

CASTER HAVING INTERFITTING HOUSING MEMBERS WITH INTEGRAL BEARINGS AND A SEPARATE AXLE

Bernard Kotzin, 510 Anderson St., Manhattan Beach, Calif. 90266

Filed Jun. 23, 1986, Ser. No. 877,533

Int. Cl.[4] B60B *33/00*

U.S. Cl. 16—46 **5 Claims**

1. In a caster constructed so as to include a rigid yoke having a center portion and arms which extend generally parallel to one another from the center portion, a wheel located so that the arms of the yoke extend along its sides, cooperating wheel support means on the wheel and on the yoke for holding the wheel so that it can rotate about an axis extending between the arms and a caster support located on the center portion of the yoke for mounting the caster so that it can rotate about an axis which is offset relative to the axis of rotation of the wheel the improvement which comprises:

said yoke being formed of two separate housing members, each of said arms being integral with one of said members,

cooperating interfitting means on both of said members for positioning said housing members so that they cannot slide relative to one another, and

fastener means for securing said housing members against relative movement with respect to each other, said fastener means extending between and engaging both of said housing members, said arms include aligned cylindrical bosses on the adjacent surfaces of said arms, and said wheel is shaped so as to receive said bosses so that said bosses serve as an axle for said wheel, said bosses are hollow bosses having aligned openings formed therein and including a separate axle located within both of said bosses so as to extend between said arms.

4,689,849

CONTROL MECHANISM FOR A DOOR OF A MOTOR VEHICLE WITH A RECIPROCATING SAFETY VALVE

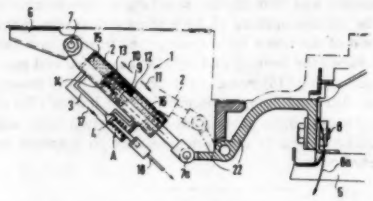
Georg Eger, Hochdorf/Vaihingen, and Rainer Srock, Leonberg, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 820,330, Jan. 21, 1986, abandoned. This application Apr. 10, 1986, Ser. No. 850,004

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501713; May 29, 1985, 3519203

Int. Cl.[4] E05F *5/02*

U.S. Cl. 16—82 **8 Claims**



1. A control mechanism for a motor vehicle door of the type which is swingably linked to a vehicle body door post and includes interior and exterior door handles, said control mechanism comprising:

a piston-cylinder unit arranged between the door post and the vehicle door for dampering door opening and closing movements, said piston-cylinder unit exhibiting passage opening means and communicating two working chambers of opposite effective pressure surfaces of the piston-cylinder unit and interior valve means controlling the passage opening means in response to relative movement of the vehicle door and door post,

and control circuit means connecting the two working chambers separately from the passage opening means, said control circuit means including blocking valve means controlled by the door handles in such a way that the door can be blocked in at least one intermediate position,

wherein said blocking valve means is reciprocable against a biasing force between a release position when said door handle is actuated and a closing position when said door handle is not actuated;

said blocking valve means including a substantially flat control surface;

said control circuit means including a widened portion with a diameter wider than a remaining portion of said control circuit means and substantially equal to the diameter of said control surface, said widened portion forming a pressure column means for reciprocating said blocking valve means to said release position when there is excessive pressure in said pressure column means.

4,689,850

PULLEY MOUNT FOR WINDOW BALANCE SYSTEM

Robert S. Flight, Rochester, N.Y., assignor to Caldwell Manufacturing Company, Rochester, N.Y.

Filed Jun. 30, 1986, Ser. No. 880,594

Int. Cl.[4] E05D *13/00*

U.S. Cl. 16—197 **32 Claims**

1. A pulley mount for a window balance system, said pulley mount comprising:

a. a support plate having a hole;

b. a shoulder rivet having a shaft fitting through said hole and a shoulder abutting against said support plate around said hole;

c. a pulley mounted on said shoulder between said support plate and a head for said rivet;

d. a bushing mounted on said rivet shaft; and

e. another pulley mounted on said bushing between said support plate and a riveted end of said rivet.

4,689,851

ELASTIC HINGE FOR EYEGLASSES

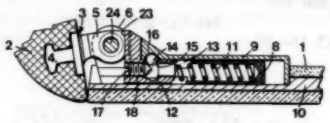
Karl Beyer, Meyrin, Switzerland, assignor to LN Industries SA, Geneva, Switzerland

Filed Mar. 17, 1986, Ser. No. 840,039

Claims priority, application Switzerland, May 1, 1985, 01842/85

Int. Cl.[4] G02C *5/22*

U.S. Cl. 16—228 **5 Claims**



1. Elastic hinge for eyeglasses comprising two parts (3 and 8) articulated to one another between open and folded positions, an elongated box (9) defining a housing (13) and adapted to be fixed to an eyeglass temple (1),

one (8) of said parts (3 and 8) slidably disposed in said housing (13),

a return spring (11) biasing said sliding part (8),

a closing part (12) extending partially into said housing (13) and holding said return spring (11) in said housing (13),

locking means (14) fixing said closing part (12) in relation to said box (9),

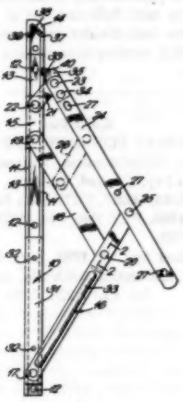
characterizied in that said closing part (12) includes a tapped hole (18) oriented longitudinally in relation to said sliding part (8), a screw (17) disposed in said tapped hole (18) and acting on said locking means (14), said screw (17) having a head accessible in the folded position of said temple (1).

4,689,852

FRICTION SUPPORTED STAYS FOR WINDOWS

John E. Buckley, Tewkesbury, United Kingdom, assignor to Securistyle Limited, Nottingham, England

Continuation of Ser. No. 560,559, Dec. 12, 1983, abandoned.
This application Nov. 20, 1985, Ser. No. 799,559
Claims priority, application United Kingdom, Dec. 24, 1982, 8236777
Int. Cl.[4] E05C 17/04
U.S. Cl. 16—341 8 Claims



1. A friction supporting stay for being fitted to a window comprising:

a track;

a slider movable along said track;

a strut having first and second ends and pivotally connected at said first end to said track;

a brace having first and second ends and pivotally connected at said first end to said slider and pivotally connected at said second end to said strut between the first and second ends of said strut;

a link having first and second ends and pivotally connected at said first end to said slider;

a cap member disposed at the end of said track remote from the first end of said strut and having two internal cam surfaces perpendicular to the plane of said track and extending outward therefrom and meeting at an apex, the internal cam surfaces on said cap member being asymmetrically disposed with respect to the central longitudinal axis of the track, one cam surface being at a greater angle to the axis than the other; and

a bar having first and second ends and pivotally connected at said first end proximate the second end of said link and pivotally connected to the second end of said strut at a point between the first and second ends of said bar and adapted so that as said slider moves along said track said bar swings from a closed position overlying said track to an open position angled with respect to said track, said bar having a nose portion formed at the first end thereof which has two external surfaces meeting at an apex and correspondingly shaped to co-operate with the two internal cam surfaces of said cap member and which enters said cap member and engages the two internal cam surfaces thereof with a wedging action as said bar is moved into the closed position;

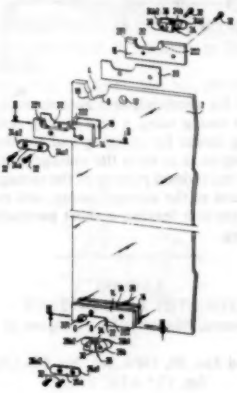
said two external surfaces of said nose portion and said two internal cam surfaces of said cap member being disposed such that the apex of the two external surfaces of said nose portion is offset relative to the longitudinal axis of said bar toward the side thereof more proximate said track, the offset ensuring that said nose position enters said cap member even if said track, said strut, said brace, said link or said metal bar are deflected due to loading thereof.

4,689,853

HINGE MEMBER FOR AN ALL-GLASS PLATE MEMBER INCLUDING A METAL FITTING

Mario Marinoni, Magenta, Italy, assignor to Casma di V. Marinoni & Figli, Magenta, Italy

Filed Apr. 11, 1986, Ser. No. 850,976
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1985, 3538964
Int. Cl.[4] E05D 5/02
U.S. Cl. 16—382 12 Claims



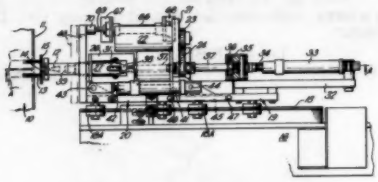
1. Metal fitting for glass doors, windows, transoms and display window panels, comprising an all-glass plate member having a pair of opposite face surfaces and at least one pair of edges extending between said face surfaces, an elongated recess formed in each said edge and extending between said face surfaces, a pair of clamping plates each arranged to be located on an opposite one of said face surfaces, first means for interconnecting said clamping plates and for pressing said clamping plates against said plate member, said first interconnecting means extending through said plate member, each said pair of clamping plates having an elongated recess therein arranged to align with the recess in said edge and with one another with said clamping plates covering the face surfaces of said plate member in which the edge recess is formed, a hinge member arranged to be fitted into said recess in said edge and into said recesses in said clamping plates, said hinge member comprising at least two hinge member parts each arranged to fit into a different one of said recesses in said clamping plates, a shoulder at each end of said elongated recesses in said clamping plates with said shoulders projecting into said recesses and forming a support surface, each of said hinge member parts having spaced end sections and each said end section arranged to seat against the support surface of one of said shoulders in the recess of the corresponding said clamping plate, one said hinge member part having a projecting region thereon projecting outwardly therefrom toward the other said hinge member part with said projecting region located between and spaced from said end sections thereon, and second means for interconnecting said hinge member parts, said second interconnecting means comprising bolts extending through and interconnecting said hinge member parts and being spaced from and located between said projecting region and said end sections, the tightening of the bolts causing said other hinge member part to bend slightly about the projecting region and thereby grip tightly at the shoulders to cause the hinge member parts to fit tightly in the recesses.

4,689,854

HEAT SEALING MACHINE

Barry R. Wakefield, Cambusbarron, Scotland, and Francis J. Pullen, Willingham, England, assignors to Devro, Inc., Somerville, N.J.

Filed Dec. 1, 1986, Ser. No. 936,687
Int. Cl.[4] A22C *13/00*
U.S. Cl. 17—1 R 11 Claims



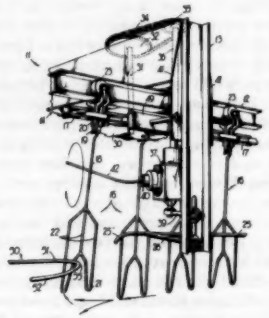
1. A machine for receiving and automatically sealing one end of a sausage casing using a heat sealing process, the machine comprising means for gripping and rotating one end of the sausage casing so as to twist the sausage casing, means for applying heat to the twisted portion of the sausage casing so as to heat seal the end of the sausage casing, and means to sever the heat sealed portion leaving a short protruding length of heat sealed casing.

4,689,855

POULTRY LINE DIVIDER

Woodal W. Dameron, Marietta, Ga., assignor to Cantrell Machine Co.

Filed Jan. 30, 1986, Ser. No. 824,122
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 11 Claims



1. An apparatus for separating poultry feed in a defined forward direction along a generally predetermined line, comprising:

conveyor means for sequentially conveying, at a selected operative speed in the forward direction along said predetermined line, poultry suspended from shackles;

rotary drive means, positioned with the axis of rotation thereof substantially parallel with said predetermined line, for rotating at a rotary speed having a selected relationship with said operative speed of said conveyor means, and synchronized with said shackles conveyed thereby;

a deflector bar mounted on said rotary drive means for rotation thereby, said bar including a base portion projecting substantially away from said rotation axis, and further including an extending portion attached to said base portion and projecting substantially along said rotation axis but radially displaced therefrom, said extending portion being adequately displaced from said axis to selectively project into said predetermined line upon rotation of said rotary drive means so as to engage shackles therein and thereby deflect such selected shackles from said line;

divider guide means, situated generally along said predetermined line downstream from said rotary drive means, for guiding into one of at least two discrete paths shackles conveyed by said conveyor means, depending on whether said shackles are conveyed substantially in said predetermined line or have been deflected therefrom; wherein

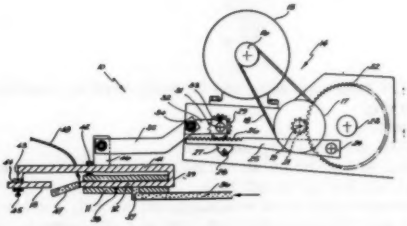
said rotary speed of said rotary drive means may be selected so as to controllably cause one out of a selected number of shackles to be periodicially deflected from said predetermined line by said deflector bar at a point in said line upstream from said divider guide means and continuing thereto, so that poultry is separated along said line at a desired ratio.

4,689,856

MATERIAL FORMING APPARATUS

Royce G. Gibson, Murwillumbah, Australia, assignor to Tendapak Holdings Pty. Limited, Brisbane, Australia

PCT No. PCT/AU85/00087, § 371 Date Feb. 19, 1986, § 102(e) Date Feb. 19, 1986, PCT Pub. No. WO85/04784, PCT Pub. Date Nov. 7, 1985
PCT Filed Apr. 19, 1985, Ser. No. 821,740
Claims priority, application Australia, Apr. 19, 1984, PG4671
Int. Cl.[4] A22C *7/00*
U.S. Cl. 17—32 6 Claims



1. An apparatus for forming paste-like materials into discrete product units comprising an elongate, open ended tube of substantially constant internal cross-sectional shape, an inlet port through the wall of the tube intermediate its ends to allow the entry of paste-like material into the interior of the tube, a piston means including first and second piston members spaced apart in axial alignment and adapted to be moved together relative to the tube between a first position in which the space between them is effectively external of the tubes and a second position in which that space is completely within the tube and in communication with the inlet port therein, the apparatus further including means adapted to cause the piston members to undergo a short oscillation when at the first and/or second positions.

4,689,857

WEB WEIGHT CONTROL SYSTEM

Akiva Pinto, Gastonia, N.C., assignor to John D. Hollingsworth On Wheels, Inc., Greenville, S.C.

Filed Sep. 1, 1987, Ser. No. 886,711
Int. Cl.[4] D01H *5/38*
U.S. Cl. 19—105 19 Claims

1. A method for controlling the weight of a web produced on a carding machine of the type wherein fiber is fed from a fiber supply means to a fiber weighing means which supplies a weighed amount of fiber into a fiber delivery means which delivers fiber to a fiber storage means, said fiber storage means feeding fiber in the form of a fiber batt to a card feed roll which feeds the fiber batt to the carding machine, said method comprising:

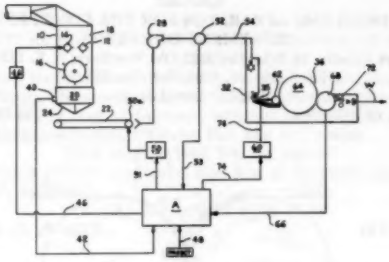
sensing the actual weight of fibers supplied to said fiber

delivery means and generating an actual fiber weight signal corresponding to the actual weight of fibers;

sensing the quantity of fibers stored in said fiber storage means and generating a fiber quantity signal corresponding to the quantity of fiber in said storage means;

establishing a preset web weight signal corresponding to a desired weight for the web being produced by said carding machine;

controlling the operation of said card feed roll in response to a comparison of said actual fiber weight signal and said



preset web weight signal and adjusting the operation of said card feed roll to maintain the weight of said web at said preset web weight during production;

controlling the fiber delivery means in response to said fiber quantity signal to maintain a prescribed fiber quantity in said fiber storage means as the operation of said card feed roll is controlled and varied; and

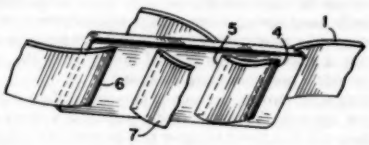
controlling the operation of said fiber supply means in response to said actual fiber weight signal to adjust the weight of fiber supplied to said fiber delivery means and maintain a prescribed fiber supply weight.

4,689,858

ADJUSTABLE RUBBER BAND

Michael T. Barber, 6427 Eppard St., Falls Church, Va. 22044

Filed Jun. 12, 1986, Ser. No. 873,728
Int. Cl.[4] B65D *63/00*
U.S. Cl. 24—17 B **1 Claim**



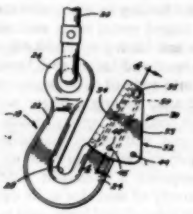
1. A fastening device consisting of a flat rectangular piece of polymer plastic which forms a clasp with two sets of two equally spaced slits at either end of the clasp, where rubber material exhibiting a high coefficient of friction, forms a band which is temporarily adjusted by entering one of the two sets of slits at one end, transversing the distance between this slit and the next closest slit of the set from the opposite side of the clasp to form a temporary adjustment of the length of the band because of material/material friction between the rubber band surface and the polymer/plastic surface, and whose adjustment remains constant because of this material/material friction and the fact that the width of the band between the slits upon stretching remains conserved showing little or no decrease in the total frictional force between the rubber and plastic surface, and where the other end of the band is permanently attached in a utilitarian sense to the clasp by entering the second set of slits at the opposite end of the clasp as was described for the temporarily adjusted end, or by some other permanent means, to form any designated circumference allowed by the total length of the band to retain an object or objects which are classified by using different colored polymer/plastic clasps, by the use of printed tag extensions on the side of the clasp or by employing an ink marker to write on the top of the clasp, wherein the free end of the band is adapted to pass over an end portion of said clasp through the adjacent slit end portion, then passes under the clasp and through the associated slit and above the clasp to provide a pull tab for adjusting the band; and the dimensions of the band and the associated slits being such that the friction forces generated during tightening of the band will be held constant irrelevant of whether the device is in use or not.

4,689,859

HOOK WITH SAFETY LATCH

Thomas A. Hauser, Rockford, Ill., assignor to The Caldwell Co., Inc., Rockford, Ill.

Filed Nov. 13, 1985, Ser. No. 797,454
Int. Cl.[4] A44B *13/02*
U.S. Cl. 24—233 **3 Claims**



1. A safety hook comprising a generally U-shaped piece of metal having first and second legs, said second leg having a solid free end portion and having a second remaining portion located adjacent said free end portion, each of said legs having inboard and outboard sides and having a pair of laterally facing sides, an eye on the free end portion of said first leg, and a latch for retaining an element between said legs, said latch comprising a single-piece latching member of generally U-shaped cross-section and defined by two laterally spaced wings and by a plate having a free end portion and an inboard side, said plate being formed integrally with and extending laterally between said wings, said latching member being located with said wings straddling said second leg and with said plate disposed adjacent the inboard side of said second leg, the free end portion of said second leg including an elongated relief area which lies outwardly of the inboard side of the remaining portion of said second leg, means extending between said wings and the free end portion of said second leg and mounting said latching member for swinging toward and away from said first leg between latched and unlatched positions, the free end portion of said plate engaging and being stopped by the inboard side of said first leg when said latching member is in said latched position and being received within and engaging the elongated relief area of the inboard side of said second leg when said latching member is in said unlatched position so as to cause the inboard side of said plate to lie outwardly of the inboard side of the remaining portion of said second leg, a laterally extending hole formed through said second leg, two balls located in the two end portions of said hole, a spring located within said hole between said balls and urging the balls toward the ends of said hole, first and second angularly spaced openings formed in each of said wings adjacent the free end portion thereof, each of said openings having a diameter less than the diameter of said balls, said first openings receiving said balls when said latching member is in said latched position and coacting with said balls to releasably hold said latching member in said latched position, and said second openings receiving the same balls when said latching member is in said unlatched position

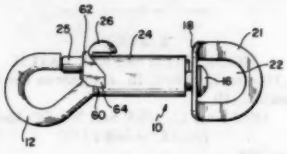
and coacting with said balls to hold said latching member releasably in said unlatched position.

4,689,860

HOOK

Bernard Suchowski, Marlboro, N.J., assignor to The Hartz Mountain Corporation, Harrison, N.J.

Filed May 23, 1986, Ser. No. 866,388
Int. Cl.[4] A44B *13/02*
U.S. Cl. 24—239 **2 Claims**



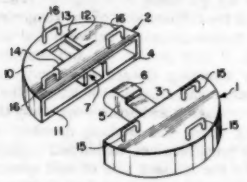
1. A snap hook comprising a hook portion having a hook with a free end and having an elongated stem, a body formed from a bent and folded metal sheet enclosing said stem, said body having sides and having opposed edges defining a slot at its top having an open end facing said hook end, a snap movable in said body into and out of engagement with the free end of said hook, said snap having a finger actuatable projection extending through said slot, spring means biasing said snap toward said hook end, and means connecting the edges of said slot at said slot open end and to prevent expansion of said slot which means comprises a U-shaped saddle having a body extending transversely of said slot at its open end and having legs overlying said sides of said body, said saddle being secured to said body.

4,689,861

ANCHORING DEVICES FOR JOINING OVERLAPPING CLOTHS FOR GARMENTS OR ARTICLES MANUFACTURED WITH THEM

Alberto Kopelowicz, 103 Heredia 1165, SanMartin, Buenos Aires 1650, Argentina

Filed May 30, 1986, Ser. No. 869,041
Claims priority, application Argentina, Jun. 18, 1985, 300739
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—662 **7 Claims**



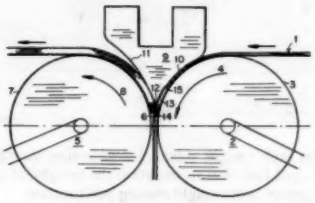
1. An anchoring device for joining articles comprising a male part and a female part, each having a plane face, wherein the male part further comprises a substantially square cross-section stem extending perpendicularly from the plane face, said stem having a widening in the shape of a hook, and wherein the female part further comprises a tube with an axis perpendicular to the plane face, having a cavity with a square cross-section and extending along said axis in a direction opposite the male part for a distance approximately equal to the length of said stem and adapted to receive said stem, said tube having a pair of parallel elastically deformable walls and a pair of parallel non-deformable walls, one of said non-deformable walls containing an anchoring window which is adapted to receive the widening of the stem and wherein said female part further comprises an exterior casing, said casing being attached to said plane face and said pair of non-deformable walls, and in which said anchoring window is formed by two pairs of opposite transverse edges in one of said non-deformable walls, one pair of said transverse edges being non-deformable and the other pair of edges being elastically deformable, said elastically deformable transverse edges being parallel to the axis of said tube and perpendicular to said place face.

4,689,862

METHOD AND APPARATUS FOR THE COMPRESSIVE TREATMENT OF FABRIC

Frank Catallo, 84 Wheatley Rd., Old Westbury, N.Y. 11568

Filed Apr. 25, 1986, Ser. No. 856,613
Int. Cl.[4] D06C *21/00*
U.S. Cl. 26—18.6 **10 Claims**



1. An apparatus for the compressive treatment of fibrous thread interlaced material having an initial thickness comprising:

(a) a first movable uninterrupted cylindrical surface;

(b) means for moving the first movable surface at a first speed;

(c) a second movable uninterrupted surface;

(d) a confining means spaced from the first and second movable surfaces, having a smooth arcuate apex and extending between the first and second surfaces to form a stuffing chamber therewith into which material is adapted to be moved by the first movable surface and from which material is adapted to be moved by said second movable surface around the apex;

(e) said confining means including a first concave confining surface of uniform smoothness connecting with said apex and spaced from and opposite the first movable cylindrical surface and having a first portion adjacent the apex which is spaced a greater distance from said first movable surface than a second portion located further from the apex to provide a precompacting zone; and

(f) means for moving the second movable surface in a direction opposite the first movable surface at a speed slower than said first speed to move said material therealong at a retarded speed less than the first speed to thereby precompact the material in said precompacting zone.

7. A method for the compressive treatment of a fibrous thread interlaced web material wherein said web is forced into a stuffing chamber formed by a space between a first movable uninterrupted cylindrical surface and a second movable uninterrupted surface and a smooth arcuate apex of a confining means extending in part between and spaced from the first and second surfaces with the confining means having a concave confining surface of uniform smoothness connecting with said apex opposite said first surface and spaced from said first surface by a first distance along a first portion of said concave confining surface and spaced a second distance greater than said first distance along a second portion of said concave confining surface comprising the steps of:

(a) moving the first surface at a first rate of speed to move the web between said first surface and the confining surface along said first portion toward said stuffing chamber;

(b) moving the web into the space between the second por-

tion of said concave confining surface allowing the web to precompact therein without buckling;

(c) moving the web into the stuffing chamber; and

(d) moving said second surface at a second rate of speed slower than said first rate of speed in a direction opposite the movement of said first surface to move said material around said apex, out of said stuffing chamber and along and between said second surface and said confining means while retarding the speed of the web to cause said precompacting.

4,689,863

FIXTURE FOR MACHINING THE CUTTING LINE OF A PIPE

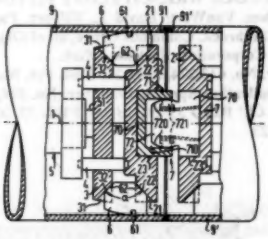
Robert Weber, Uttenreuth; Roland Bieselt, Weinheim; Siegfried Förner, Herzogenaurach, and Helmut Mechtold, Nürnberg, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,907

Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319319

Int. Cl.[4] B23Q *39/00*; B23K *37/04*

U.S. Cl. 29—33 T **10 Claims**



1. Fixture for machining the cutting line of a pipe, comprising a centering device insertible into an end section of the pipe, said centering device including a clamping system having pressure pieces with prismatic pressure surfaces formed thereon, said pressure pieces being disposed about the longitudinal axis of said centering device, and a pressure motor for driving said pressure pieces in radial direction of the pipe, for maintaining an equal distance between each of said pressure surfaces and the longitudinal axis of said centering device and for holding said centering device in the pipe with said clamping system, a coupling device disposed at an end of said centering device along the longitudinal axis thereof, said coupling device including a coupling part having a cylindrical receptacle formed therein; an accessory device in the form of another centering device including a coupling post having a spherical surface formed thereon matching said cylindrical receptacle; and hydraulic means for detachably connecting said coupling post to said cylindrical receptacle by remote control.

4,689,864

METHOD OF MAKING VALVE SLEEVES

Nobuo Fukuma, Toyota; Hisayasu Hasegawa, Aichi; Kimimasa Murayama, Toyota; Kunio Hayashi, Nagoya, and Yoshihiro Tokudome, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 661,920, Oct. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 515,635, Jul. 20, 1983, abandoned. This application Mar. 28, 1986, Ser. No. 843,820

Claims priority, application Japan, Jul. 28, 1982, 57-131738

Int. Cl.[4] B21D *53/00*

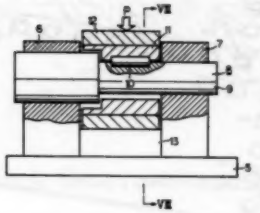
U.S. Cl. 29—157.1 R **3 Claims**

1. A method of machining a valve sleeve on a device having a base, a support member fixedly secured to the base, a shaft mounted on the support member, and a male die secured to the shaft, comprising:

(a) mounting an annular cylindrical workpiece on the male die;

(b) applying pressure to the workpiece in a direction toward the male die;

(c) forging the workpiece by applying pressure to it toward the male die, thereby forming a first groove on an interior surface of the workpiece;



(d) applying pressure to the workpiece in a direction away from the male die;

(e) rotating the workpiece a predetermined amount;

(f) repeating steps (c) through (e), thereby forming multiple grooves in the workpiece until a predetermined number of grooves have been formed in the workpiece ending with a final groove being formed adjacent to the first groove; and

(g) machining at least one of the multiple grooves adjacent to the final groove a second time.

4,689,865

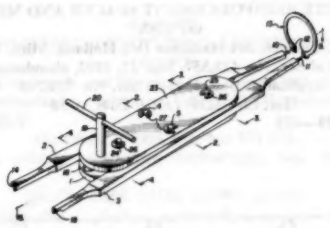
SNAP RING TOOL

Henry F. Chamblee, 906 Taylor St., Sulphur, La. 70663

Filed Oct. 14, 1986, Ser. No. 918,524

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—229 **6 Claims**



1. A tool for selectively installing or removing conventional apertured snap rings and split C-rings, comprising, a mounting plate, a pair of elongated, spaced, parallel arms, means pivotally connecting said arms to said mounting plate, an axially extending pin secured to one end of each of the arms adapted to be inserted into the apertures of a conventional snap ring, and a recess provided in the other end of each of said arms adapted to receive the split ends of a conventional C-ring, whereby, an external snap ring can be manipulated by manually squeezing the recessed ends of the arms in a direction toward each other to spread the pin ends of the arms, to thereby expand the external snap ring; a C-ring can be manipulated by manually squeezing the pin ends of the arms in a direction toward each other to spread the recessed ends of the arms, to thereby expand the C-ring.

4,689,866

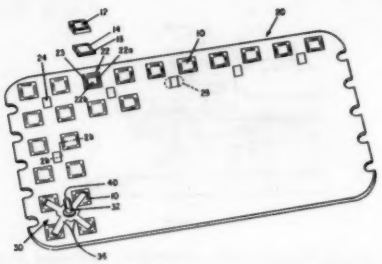
METHODS FOR TRANSFERRING SPRING CLIPS

John S. Cartwright, Hopewell Township, Mercer County, N.J., assignor to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 683,065, Dec. 18, 1984, Pat. No. 4,582,245. This application Jan. 10, 1986, Ser. No. 817,652

Int. Cl.[4] B23K *31/02*

U.S. Cl. 29—426.6 **2 Claims**



1. A method of transferring an article, having an elongated central member with first and second ends and a plurality of resilient arms extending radially therefrom, comprising the steps of:

(a) positioning a first planar body, having the first end of the central member lockably engaged therewith, proximate a second planar body having an opening therein;

(b) imparting relative movement to the first and second planar bodies to position the second end of the central member in the opening:

(c) rotating the elongated central member to unlock the first end of said member from the first planar body while simultaneously lockably engaging the second end thereof to the second planar body; and

(d) imparting relative movement to the first and second planar bodies to withdraw the first end of the elongated central member from the first planar body.

4,689,867

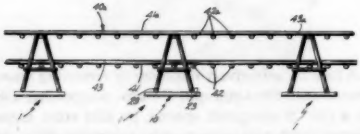
CONCRETE REINFORCEMENT SPACER AND METHOD OF USE

Wilbur E. Toliver, 364 Hamilton Dr., Holland, Mich. 49423

Division of Ser. No. 423,557, Sep. 27, 1982, abandoned. This application Jun. 3, 1985, Ser. No. 739,769

Int. Cl.[4] B23P *11/02;* **E04C** *5/16*

U.S. Cl. 29—453 **3 Claims**



1. A method for reinforcing concrete comprising:

positioning a plurality of spacers throughout a concrete form;

providing each spacer with a base platform, a pair of inverted, generally U-shaped spaced uprights and a pair of lateral cross supports extending between said uprights, each of said uprights comprising a metal rod bent into said generally U-shaped configuration so as to define a pair of spaced legs joined by an upper top member, said legs being secured at their bottoms to said platform, said uprights being inclined at an angle towards one another so that they are relatively close together at said top members and are spaced farther apart at the bottoms of said legs, said lateral cross supports being secured to and extending between opposed legs on adjacent uprights at a point spaced below said top members whereby in side elevation, the spacers have a generally "A" shaped configuration;

spacing said tops of said uprights sufficiently far apart to allow passage therebetween of a reinforcement rod therebetween and into a position between said spaced uprights, supported by said cross supports, but sufficiently close together so as to prevent easy or accidental withdrawal of said reinforcement rod from between said uprights;

supporting a first reinforcement mat on said spacers, said first mat comprising a plurality of generally parallel rods joined at generally right angles to a second plurality of generally parallel rods, by inserting one of said rods at each said spacer through said spacing at the tops of said uprights and into position resting on said cross supports;

supporting a second mat on said spacers, said second mat also comprising a plurality of generally parallel rods joined at generally right angles to a second plurality of generally parallel rods, by supporting one of said rods at each of said spacers on said tops of said uprights.

4,689,868

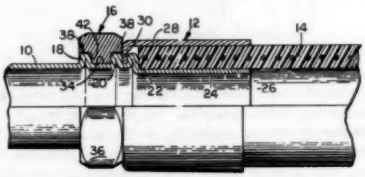
BEADLOCK WRENCH FLOAT FITTING

Brett A. Hughes, VanWert; David L. Gilbert, Paulding, and Eugene A. Ellerbrock, Columbus Grove, all of Ohio, assignors to Aeroquip Corporation, Jackson, Mich.

Division of Ser. No. 613,274, May 24, 1984, Pat. No. 4,596,410. This application Apr. 28, 1986, Ser. No. 856,766

Int. Cl.[4] B21D *39/00, 53/00;* **F16L** *25/00*

U.S. Cl. 29—523 **1 Claim**



1. The method of attaching an annular wrench engaging member having wrench flats, lateral sides and recesses defined in the lateral sides having radially disposed surfaces to a deformable metal conduit comprising the steps of:

(a) axially locating the wrench engaging member upon the conduit,

(b) imposing an axial force upon the conduit to cause the conduit to outwardly deform adjacent and into contact with each lateral radially extending side of the wrench engaging member, and

(c) axially compressing the conduit deformed portions toward the wrench engaging member to deform conduit material into the member recesses to prevent rotation of the member upon the conduit.

4,689,869

FABRICATION OF INSULATED GATE GALLIUM ARSENIDE FET WITH SELF-ALIGNED SOURCE/DRAIN AND SUBMICRON CHANNEL LENGTH

Chakrapani G. Jambotkar, Hopewell Junction, and Robert B. Renbeck, Staatsburg, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

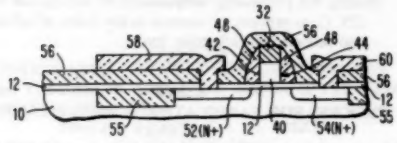
Filed Apr. 7, 1986, Ser. No. 848,874

Int. Cl.[4] H01L *21/00*

U.S. Cl. 437—44 **30 Claims**

1. Method for forming an insulated GaAs-gate FET having submicron channel length comprising:

(a) providing a GaAs substrate having layers of AlGaAs and doped GaAs thereon;
(b) forming a submicron dimensioned conductor contacting said doped GaAs layer;
(c) forming, by anisotropic etching, using said conductor as a mask, a GaAs gate of submicron width from said doped



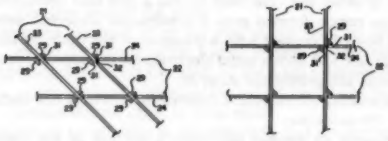
GaAs layer, said conductor serving as self-aligned contact to said gate;
(d) establishing submicron-wide insulator sidewalls to the GaAs gate and its associated contact structure; and
(e) ion implanting to form source and drain in said substrate, said source and drain being self-aligned to said gate and the AlGaAs beneath the gate serving as the gate insulator.

4,689,870

METHOD OF MAKING HONEYCOMB FLOOR PANEL

David F. Mieyal, Strongsville, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Division of Ser. No. 783,127, Oct. 2, 1985, Pat. No. 4,594,833, which is a division of Ser. No. 555,142, Nov. 25, 1983, Pat. No. 4,573,304. This application Mar. 24, 1986, Ser. No. 843,006
Int. Cl.[4] B21D *35/00, 39/00*; E04C *2/42*
U.S. Cl. 29—469.5 **3 Claims**



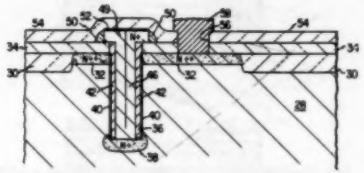
1. A method of forming honeycomb structures comprising forming lateral slits partially across thin metal elongated strips at intervals along the length thereof without removing substantial metal and bending a tab along at least one side of said slits out of the plane of said strips to provide an angulated tab spaced from the opposite edges of said slits, positioning said tabs so that the longitudinal spacing between the edges of said tabs and the opposite edges of said slits is at least substantially as small as the thickness of said strips, said tabs provding an angulated throat having a width substantially greater than the thickness of said strips, positioning said strips in two arrays of parallel strips angulated with respect to the strips of the other arrays in alignment with said angulated throats, assembling said arrays with said arrays angulated until said strips extend through associated slits in the strips of the other arrays, thereafter turning said arrays relative to each other until a position is reached in which opposite edges of said slits engage opposite sides of said strips extending therethrough, and locking said arrays in said position.

4,689,871

METHOD OF FORMING VERTICALLY INTEGRATED CURRENT SOURCE

Satwinder D. S. Malhi, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 24, 1985, Ser. No. 779,748
Int. Cl.[4] H01L *21/302, 21/441*
U.S. Cl. 437—40 **11 Claims**



1. A method for forming a semiconductor device, comprising:
providing a silicon substrate of a first conductivity type;
forming a first buried region of a second conductivity type in the silicon substrate;
forming a trench in the silicon substrate extending through the first buried region, the trench having sidewalls and a bottom, the bottom extending into the substrate and below the first buried region;
forming an insulating layer on the sidewalls of the trench;
forming a second buried region of the second conductivity type in the silicon substrate at the bottom of the trench;
forming a conductive layer over the bottom of the trench contacting said second buried region and over the insulating layer covering the sidewalls of the trench to form a gate region on the sidewalls which is conductively connected with the second buried region;
the area in the silicon substrate adjacent the trench and between the first and second buried regions comprising a channel region; and
forming a first interconnect to the conductive layer and forming a second interconnect to the first buried region, the first and second interconnects operable to be interfaced with external circuitry.

4,689,872

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

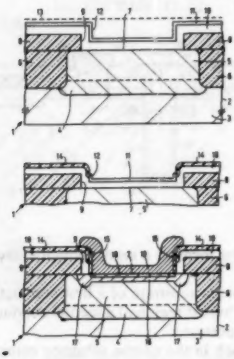
Johannes A. Appels, and Henricus G. R. Maas, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 3, 1985, Ser. No. 771,930
Claims priority, application Netherlands, Sep. 18, 1984, 8402856
Int. Cl.[4] H01L *21/22, 21/265, 21/318*
U.S. Cl. 437—228 **4 Claims**

1. A method of manufacturing a semiconductor device comprising the steps of
forming an insulating layer on a surface of a semiconductor body, said insulating layer having an opening to said surface;
providing a substantially uniform layer of a first semiconductor material over said insulating layer and said surface in said opening;
covering said first semiconductor material with a substantially uniform layer of an oxidation preventing material;
selectively removing portions of said oxidation preventing layer, said portions being free of said opening;
oxidizing exposed portions of said first semiconductor material over a part of the thickness of said first semiconductor material;
removing remaining portions of said oxidation preventing layer in said opening;

anisotropically etching at least parts of said first semiconductor material in said opening, said first semiconductor material remaining along edges of said opening;

oxidizing said first semiconductor material remaining along said edges of said opening to form a mask; and



exposing said surface of said semiconductor body in said opening to semiconductor ions through said mask to form portions of a semiconductor device.

4,689,873

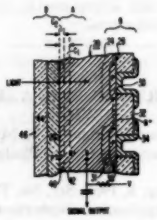
IMAGING DEVICE HAVING TWO ANTI-REFLECTION LAYERS ON A SURFACE OF SILICON WAFER

William M. Kramer, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Division of Ser. No. 489,303, Apr. 28, 1983, Pat. No. 4,594,605. This application Aug. 27, 1985, Ser. No. 769,742

Int. Cl.[4] H01L *27/14, 31/18*

U.S. Cl. 437—2 **2 Claims**



1. A method of making an imaging device having improved quantum efficiency in the range of 400 nanometers to 500 nanometers comprising the steps of:

preparing a silicon wafer of a first-type conductivity, said wafer having first and second major surfaces;

forming a plurality of regions of a second-type conductivity in the second major surface of said wafer;

implanting an element into said first major surface of said wafer so as to form a region of enhanced first-type conductivity for controlling blooming spaced from said first surface;

forming a shallow region of second-type conductivity extending into said wafer from said first surface a distance less than said region of enhanced first-type conductivity,

providing a first anti-reflection layer on said first surface of said wafer by depositing thereon at ambient temperature a material having a high index of refraction ranging from 2.3 to 2.4 thereon, said first anti-reflection layer having an optical thickness substantially equal to a quarter of the wavelength of light incident thereon;

providing a second anti-reflection layer on said first anti-reflection layer by depositing thereon at ambient temperature a material having a low index of refraction ranging from 1.32 to 1.35 thereon, said second anti-reflection layer having an optical thickness substantially equal to a quarter of the wavelength of light incident thereon; and

limiting the processing temperature of said device to about 125° C. to prevent an increase in the index of refraction of said second anti-reflection layer.

4,689,874

PROCESS FOR FABRICATING A THIN-FILM SOLAR BATTERY

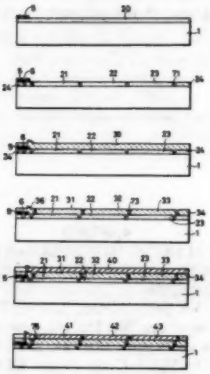
Masaharu Nishiura, Kanagawa, Japan, assignor to Fuji Electric Company, Ltd., Kanagawa, Japan

Filed May 15, 1986, Ser. No. 863,426

Claims priority, application Japan, May 16, 1985, 60-104375

Int. Cl.[4] H01L *31/18, 27/14*

U.S. Cl. 437—2 **6 Claims**



1. A process for fabricating a thin-film solar battery having one or more unit cells each having a thin-film semiconductor active region formed over a transparent dielectric substrate and being in contact with a transparent electrode on the substrate side and with a metal electrode on the opposite side, said process comprising the steps of:

depositing a transparent conductive film over one surface of the substrate;

forming an opaque film over a portion of the combined substrate and deposited transparent conductive film remote from the area where the unit cells are to be formed;

scribing with a laser beam the deposited transparent conductive film down to the substrate to form from the transparent conductive film separate transparent electrodes for the respective unit cells inward from said opaque film;

removing selected portions of the opaque area with a laser beam to form light-transmitting markers;

depositing a semiconductor film over the separate transparent electrodes and the surface of the substrate surrounding the electrodes, but not in the area where the markers are formed;

placing the substrate into proper alignment with the aid of the markers;

scribing with a laser beam the deposited semiconductor film down to the transparent conductive film to form from the semiconductor film separate active regions for the respective unit cells;

depositing a metal film over the separate active regions and the surface of the transparent conductive film surrounding

the separate active regions, but not in the area where the markers are formed;

placing the substrate into proper alignment with the aid of the markers; and

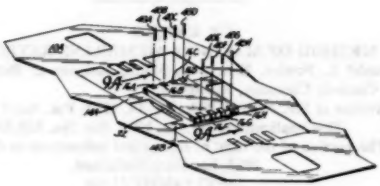
scribing with a laser beam the deposited metal film down to the semiconductor film to form from the metal film separate metal electrodes for the respective unit cells.

4,689,875

INTEGRATED CIRCUIT PACKAGING PROCESS

Russell V. Solstad, St. Paul, Minn., assignor to VTC Incorporated, Bloomington, Minn.

Filed Feb. 13, 1986, Ser. No. 828,876
Int. Cl.[4] H01L *23/04*
U.S. Cl. 437—211 **14 Claims**



1. A method for packaging semiconductor chips on a carrier tape to produce a carrier tape having packaged semiconductor chips supported thereon, the method comprising:

providing a carrier tape having a nonconductive substrate and a conductive layer, the tape having a plurality of chip bonding areas formed by an opening in the substrate with a chip support frame extending across the opening and a corresponding opening in the conductive layer with conductive leads extending from edges of the opening in the conductive layer to the frame to provide first free ends for bonding to a chip;

aligning semiconductor chips with the chip support frames so that contact pads on a first surface of the chips are positioned opposite respective first free ends of the leads;

bonding the contact pads of the semiconductor chips and the first free ends of the leads;

severing the leads from the conductive layer at predetermined distance from the frames to form second free ends;

bending the second free ends of the leads substantially perpendicularly to a plane of the carrier tape away from the semiconductor chips to form nests;

applying an adhesive to the first surface of the semiconductor chips;

positioning bases on the adhesive and within the nests; and

bending the second free ends of the leads over the bases.

4,689,876

METHOD OF MAKING WAVEGUIDE ASSEMBLY

John D. Foglesonger, Los Angeles, and David M. Vranson, Canyon Country, both of Calif., assignors to ITT Gilfillan, a division of ITT Corporation, Van Nuys, Calif.

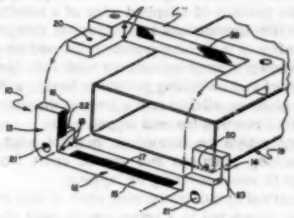
Division of Ser. No. 631,425, Jul. 16, 1984, Pat. No. 4,638,273. This application Aug. 4, 1986, Ser. No. 892,565
Int. Cl.[4] H01P *11/00*
U.S. Cl. 29—600 **8 Claims**

1. A method of making a subassembly for a waveguide joint, said method comprising the steps of:

providing a rectangular waveguide section having four sides forming four corners;

providing a flange separated into two pieces, said pieces having internal constructions for forced engagement with the exterior of said waveguide section;

placing an adhesive internally on said flange pieces;



inserting a mandrel into said waveguide section; and

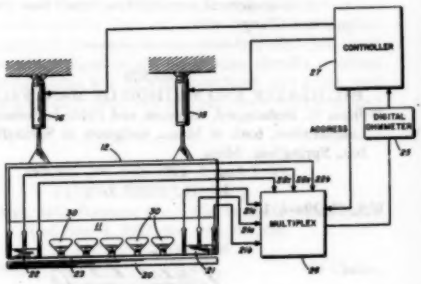
pressing said flange pieces onto said waveguide section while curing said adhesive.

4,689,877

METHOD AND APPARATUS FOR CONTROLLING THE THROAT HEIGHT OF BATCH FABRICATED THIN FILM MAGNETIC TRANSDUCERS

Mark A. Church, Los Gatos, Calif., assignor to International Business Machines Corp., Armonk, N.Y.

Continuation-in-part of Ser. No. 760,189, Aug. 29, 1985, abandoned. This application Jul. 15, 1986, Ser. No. 885,894
Int. Cl.[4] G11B *5/127*; B23Q *17/00, 15/00*
U.S. Cl. 29—603 **10 Claims**



1. In a process for batch fabricating thin film transducers, a method for measuring the position of a lapped edge of a substrate supporting said thin film transducers comprising the steps of:

depositing a plurality of switching junctions on said substrate, each of said switching junctions having a distinct switching plane parallel to and a known distance away from a desired position for said lapped edge;

depositing a shunt resistance in parallel with each of said switching junctions and spaced apart from the lapped edge to avoid severing by lapping;

forming a circuit comprising each of said switching junctions connected in a series circuit;

lapping said substrate from an initial edge of said substrate toward said desired position for said lapped edge wherein each of said switching junctions changes from a closed state to an open state when said lapping plane is coincident with said switching junction switching plane whereby said shunt resistance in parallel with said switching junction which changes state is connected into said series circuit; and

detecting stepwise changes in said series circuit resistance during lapping of said substrate, each of said changes indicating a change of state of one of said switching junc-

tions thereby identifying the position of said lapped edge to be coincident with said switching plane of said switching junction which changes state.

9. In apparatus for batch fabricating thin film transducers, said apparatus comprising an electrical lapping guide for measuring the position of a lapped edge of a substrate supporting said thin film transducers, said apparatus comprising:

a plurality of switching junctions formed on said substrate, in known spaced relation to said thin film transducers, each of said switching junctions having a distinct switching plane parallel to and a known distance away from a desired position for said lapped edge;

a shunt resistance formed in parallel with each of said switching junctions and spaced apart from the lapped edge to avoid severing by lapping;

an electrical circuit comprising each of said switching junctions connected in a series circuit, said electrical circuit having a first and a second terminal; and

a resistor element having two terminals formed on said substrate adjacent to said plurality of switching junctions, said resistor element having a resistance which changes with lapping of said substrate,

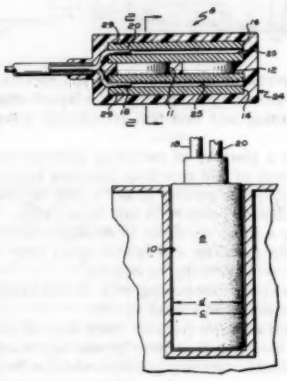
whereby, upon connection of means for measuring resistance across said first and second terminals, stepwise changes in said series circuit resistance can be detected during lapping of said substrate, each of said changes indicating a change of state of one of said switching junctions thereby identifying the position of said lapped edge to be coincident with said switching plane of said switching junction which changes state, and whereby, upon connection of means for measuring resistance across said two terminals, a lapping edge position versus resistance characteristic can be determined for said resistor element each time a switching junction changes state, whereby said resistor element is recalibrated each time a switching junction changes state.

4,689,878

PTC HEATER AND METHOD OF MANUFACTURE

William W. Beauregard, Agawam, and Peter J. Fessenden, East Longmeadow, both of Mass., assignors to Springfield Wire, Inc., Springfield, Mass.

Filed Aug. 3, 1981, Ser. No. 289,499
Int. Cl.[4] H05B *3/00*
U.S. Cl. 29—611 **2 Claims**



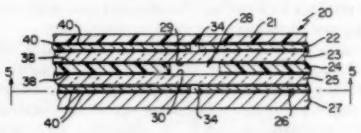
1. Method of manufacturing a heater element for use in a cylindrical metal casing of a crankcase heater comprising the steps of cutting an aluminum bar of semi-cylindrical cross-section, having a flat surface on one side thereof, into a plurality of discrete conductor members which are electrically and thermally conductive, the length of said conductor members being selected to provide a heater of predetermined wattage, forming a heater assembly by bonding the opposed flat surfaces of the conductor members to opposite sides of at least one positive temperature coefficient heater platelet using an electrically and thermally conductive adhesive and connecting lead wires to the ends of said conductor members, inserting said assembly into a mold having a cylindrical cavity and injecting silicone liquid containing a dispersion of ceramic particles into the mold cavity and curing the silicone to form an integral elastromeric sheath which encapsulates said assembly and is in surface contact with said members and the heater platelet, said sheath having an outer diameter, at room temperture, substantially less than the inner diameter of said metal casing and having a coefficient of expansion such that upon heating it will expand omnidirectionally to a diameter at least equal to that of said casing so that upon insertion of the silicone encapsulated heater assembly into the metal casing it will, when the heater is in operation, expand into overall elastic contact with the inner surface of said casing.

4,689,879

METHOD OF MAKING A MEMBRANE KEYBOARD

Daniel L. Fowler, Kentwood, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 690,982, Jan. 14, 1985, Pat. No. 4,596,905.
This application Mar. 11, 1986, Ser. No. 838,358
The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.
Int. Cl.[4] H01H *11/04*
U.S. Cl. 29—622 **20 Claims**



1. In a method of making a membrane keyboard construction comprising the steps of forming two circuit layer means, disposing and securing a spacer means between said circuit layer means, forming an opening means through said spacer means to permit said circuit layer means to be pressed together in said opening means and thereby provide a switching function, forming a face plate means, and disposing an adhesive layer means between said face plate means and one of said circuit layer means to secure said face plate means to said one circuit layer means, the improvement comprising the step of forming said adhesive layer means to have passage means therein so as to lead from an area thereof that is aligned in superimposed relation with said opening means to the exterior of said construction to vent said area thereof whereby said area is isolated from said opening means by said one circuit layer means and is vented by said passage means to tend to enhance tactile feel and avoid false switch closure of said opening means by tending to prevent entrapment of air bubbles in said area.

4,689,880

METHOD OF MANUFACTURING A POLYMER-CONSOLIDATED CADMIUM ELECTRODE FOR AN ALKALINE STORAGE CELL, AND AN ELECTRODE OBTAINED BY THE METHOD

Jean-Loup Brezillon, Parempuyre, and Jean-Michel Dauchier, Martignas sur Jalle, both of France, assignors to Saft, S.A., Romainville, France

Filed Jul. 28, 1986, Ser. No. 890,937
Int. Cl.[4] H01M *4/26*
U.S. Cl. 29—623.5 **6 Claims**

1. A method of manufacturing a polymer-consolidated cadmium electrode for an alkaline storage cell, the method comprising the steps of:

mixing the following ingredients in water: a gelling agent; cadmium and cadmium oxide in powder form constituting the active material; and a copolymer of carboxylated styrene-butadiene at a concentration lying in the range 0.5% to 3% by weight of active material;

coating the resulting paste on a metal current collector;

drying the coated current collector; and

subjecting the resulting assembly to a temperature lying in the range 120° C. to 150° C. for a period of a few minutes in order to cause said polymer to cross-link.

4,689,881

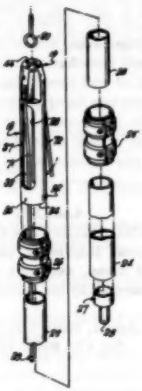
HEAD AND MAGAZINE LOADER ASSEMBLY

James C. Fall, 9531 Melvin Ave., Northridge, Calif. 91342

Filed Jul. 8, 1986, Ser. No. 883,523

Int. Cl.[4] B23Q 7/10; B21F 7/00, 15/04

U.S. Cl. 29—813 **11 Claims**



1. In a head utilized in a driver apparatus for securing a wire hanger to a beam or the like by means of an eyelet screw to which the wire hanger is applied in a tightly wound looped arrangement, the head comprising a member formed of a rigid, solid material within an outer wall and having a top and including a cavity forming crossed passageways extending to the top, the first of such cavity passageways formed by vertically-oriented walls and a bottom for containing the eyelet screw,

the improvement comprising

tapering walls converging to the top and in opposing relationship to each other included in the second of such cavity passageways,

the tapering walls diverging away from the top to terminate at corresponding opposing portions of the outer wall of said member and at which terminations corresponding openings in said outer wall are formed communicating with the first of such cavity passageways and the atmosphere, the openings being above the plane of the first passageway's bottom so that a wire passes through one of such openings threading through the screw's eyelet and thence projected out of the other one of such openings.

4,689,882

HAND TOOL AND METHOD FOR REMOVING INSULATION FROM WIRE-WOUND IGNITION CABLE

Jerome L. Lorenz, Birmingham, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 22, 1984, Ser. No. 663,537

Int. Cl.[4] H02G 1/12

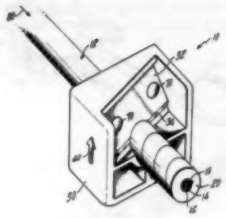
U.S. Cl. 30—90.1 **11 Claims**

1. A hand tool for removing insulation from a wire-wound ignition cable, the cable including an elongated core of circular cross section, a wire wound helically in a predetermined lead direction around the core and a tubular jacket of insulation disposed about the wire-wound core, the tool comprising:

a body having a passage therethrough, the diameter of the passage being only slightly greater than that of the ignition cable to ensure a close sliding fit of the cable within the passage;

a blade-supporting surface being formed integrally with said body adjacent to said passage; and

a blade having a cutting edge and being rigidly mounted on said blade supporting surface, said blade cutting edge extending across the passage at a lead angle thereto and at a depth for cutting at least most of the way through said cable insulation, the direction of said lead angle being



counter to that of said lead direction of said wire winding on said cable to thereby aid in maintaining the integrity of said wire winding in its wound condition on said core during relative rotation of said body and said cable in an insulation-cutting direction, said passage in said body affording feed of the cable in a cable-feed direction toward said blade, said lead angle of said blade cutting edge being greater than about 5° an said blade further being inclined forwardly in the cable-feed direction about an axis which parallels said blade edge, thereby to orient said cutting edge at a forwardly-inclined rake angle, said rake angle being measured in quadrature with said lead angle.

4,689,883

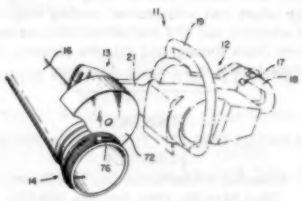
PIPE CUTTING DEVICE

Larry G. Dent, 3312 Westside Hwy., Castle Rock, Wash. 98611

Filed Nov. 4, 1985, Ser. No. 794,856

Int. Cl.[4] B23D 21/06

U.S. Cl. 30—94 **14 Claims**



1. An apparatus for cutting plastic pipe comprising;

means for engaging a pipe including rotatable cutting means for cutting said pipe to a predetermined depth,

drive means operatively associated with said pile engaging and cutting means for rotating said cutting means,

said rotatable cutting means including at least one cutting bit and mounting means therefor,

said mounting means forming a slot for receiving said cutting bit with said cutting bit being tapered such that, when mounted in said slot the bit increases in thickness toward the bottom of said slot,

deformable shim means positionable in said slot, and

locking means for deformably engaging said shim means and

pressing said shim means into engagement with said bit when said bit is mounted in said slot, whereby said bit is retained in said slot during rotation of said rotatable cutting means.

4,689,884

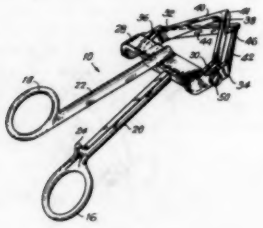
V-SNIP SCISSORS

Randy Chavarria, Lexington Ave., New York, N.Y. 10016

Filed May 28, 1986, Ser. No. 867,765

Int. Cl.[4] B26B *13/00*

U.S. Cl. 30—229 **7 Claims**



1. Scissors for cutting a V shape, and comprising first and second parts pivotably coupled for relative rotation about an axis by coupling means, said first part comprising:

(a) first means for receiving a digit;

(b) first cutting means having first and second cutting edges formed thereon; and

(c) first support means for rigidly connecting said first means for receiving a digit to said first cutting means, and

said second part comprising:

(a) second means for receiving a digit;

(b) second cutting means having first and second cutting edges formed thereon; and

(c) second support means for rigidly connecting said second means for receiving a digit to said second cutting means, said first and second support means being pivotably coupled, wherein said first and second cutting means are arranged such that said and second cutting edges of said first cutting means respectively engage said first and second cutting edges of said second cutting means during the relative rotation of said first and second parts in a closing direction, said first cutting edges performing a first cut and said second cutting edges performing a second cut, said first and second cuts defining a V shape, said first cutting edges and said second cutting edges being disposed whereby said first and second cuts are terminated at different times during said relative rotation of said first and second parts in a closing direction.

4,689,885

APPARATUS FOR CUTTING OUT A FACE IN A PUMPKIN

Thomas C. Albanese, 1 Summerset Dr., Smithtown, N.Y. 11787

Filed May 30, 1986, Ser. No. 868,575

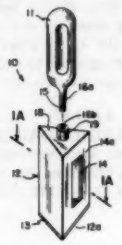
Int. Cl.[4] B26D *3/00*; B26F *1/46*

U.S. Cl. 30—316 **6 Claims**

1. An apparatus for cutting out a face in a pumpkin, which comprises:

(a) a hollow housing having an open end with a beveled edge and a slot within side thereof; said housing being generally trapezium with two curved sides in cross section so as to be used to form left and right eye cutouts in said pumpkin, said housing having a second open end with a second beveled edge opposite said first open end;

(b) a handle on other end of said housing opposite said open end so that a person can grip said handle and push said beveled edge of said housing through a side of said pumpkin to make said face by forming a pumpkin piece within said housing and allowing removal of said pumpkin piece by pushing said pumpkin piece out of said housing via said slot in said housing, said handle being removable from said housing a including a shank having external threads thereon; and



(c) a removable cap having a boss extending beyond surface of said cap, said boss having internal threads therein so that said shank of said handle can be removably threaded to said boss, said cap being generally trapezium with two curved sides in cross section so as to be removably attached to either of said ends of said housing to form said left and right eye cutouts in said pumpkin.

4,689,886

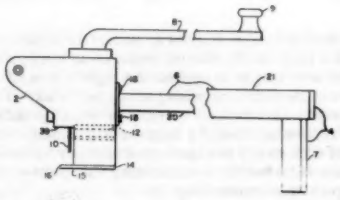
HAND HELD CAN OPENER

Richard J. Bernazzani, Roslindale, and Domenic J. Bumbaca, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 1, 1986, Ser. No. 846,688

Int. Cl.[4] B23P *17/00*

U.S. Cl. 30—416 **4 Claims**



1. An improved can opener adapted to cut a can top by rotating the can having a vertical dimension and supported on a flat surface while holding the cutting blade in a fixed position through the can lid, said cutting blade being pivotally mounted to a housing and adapted to pierce and cut the can lid and having a feed wheel mounted to said housing and perpendicular to said cutting blade to rotate the can and having means to cause said cutting blade to pierce the top of the can and means to rotate said feed wheel to advance said can while in cutting engagement with said cutting blade to cut the top of said can adjacent its lip, and having guide means mounted to said housing to guide the upper edge of the can lip as the can is being rotated by said feed wheel, wherein the improvement comprises:

(a) a protruding lip mounted on said housing and spaced from said guide means to secure the can lip therebetween to prevent the cutting blade from slipping out of the can during rotation, and

(b) a handle mounted to said housing and extending perpendicular therefrom and adapted so that a portion thereof extends along the vertical dimension of the can and rests against said flat surface and is further adapted so that downward pressure of the user on the handle toward said

flat surface holds the can opener in a stable position while the feed wheel is being rotated against said can.

4,689,887

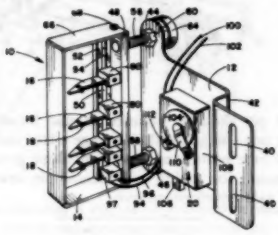
ARCHERY SIGHT

Richard Colvin, 9 Alder La., Liverpool, N.Y. 13090

Filed Jun. 23, 1986, Ser. No. 877,649

Int. Cl.[4] F41G *1/32*

U.S. Cl. 33—265 **19 Claims**



10. An illuminated bowsight for use with an archery bow, said bowsight comprising:

light emitting aiming means;

means for electrically connecting said aiming means to an electrical energy source;

means for mounting said aiming means on said bow relative to the line of sight of the archery; and,

a switch comprised of:

a base portion of nonconductive material having a generally planar surface,

electrical contact means mounted in said base portion flush with said planar surface, and

a switch member movable on said surface to electrically engage said contact means, said switch being operative to control the connection of said aiming means to said electrical power source in response to movement of the bow string on the bow, said switch having a first normal aiming means off condition and a second aiming means on condition, said switch being in said second aiming means on condition when said bow string is drawn to a predetermined position, and a third aiming means off condition, said switch assuming said third condition when said bow string is drawn past said predetermined position.

15. A sight for use with an archery bow or the like comprising:

a blade-like element;

means for mounting said blade-like element to said bow wherein said element is oriented edgewise relative to the line of sight of the archer;

a light emitting aiming point secured on the edge of said element;

conductive means in contact with said light emitting aiming point; and,

means for electrically connecting said conductive means to an electrical power source.

4,689,888

MEASURING DEVICE FOR USE WITH AUTOMOTIVE FRAME STRAIGHTENING EQUIPMENT

Roger B. Aldrich, and Gary R. White, both of Grand Island, Nebr., assignors to Chief Automotive Systems, Inc., Grand Island, Nebr.

Filed Oct. 22, 1986, Ser. No. 921,749

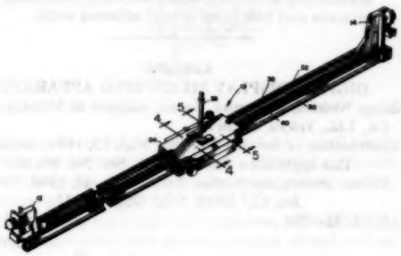
Int. Cl.[4] G01B *5/25, 11/27*

U.S. Cl. 33—288 **13 Claims**

1. An improved measuring bar assembly for use with automotive frame straightening equipment, comprising, in combination:

a first elongated bar and a second elongated bar generally parallel to the first bar, each one of the bars having opposite side surfaces, each side surface having a uniform configuration along an active length of the bar in the longitudinal direction, the first one of said surfaces defining at least two separate planar surface guide tracks, the other surface defining at least one planar surface guide track; said bars arranged with said first surfaces in opposed, uniformly spaced relation with pairs of guide tracks on the separate bars parallel to one another and defining mirror images with respect to one another;

a bar support housing, said housing including first and second longitudinally, parallel channels for receipt of the first and second bars respectively; said housing also including at least two generally opposed cylindrical follower members along the sides of each channel, said follower members each in line contact with the planar guide tracks of



the bars and rotatable about the cylindrical axis thereof, said axis generally parallel to a planar guide track thereby defining a total of at least four follower members, at least two of said follower members being intermediate follower members positioned intermediate the channels, each such intermediate follower members mounted to simultaneously engage one pair of opposed, parallel guide tracks, and at least one remaining follower member being an outside follower member engaging the other surface of the first bar with the other remaining follower member also being an outside follower member engaging the other surface of the second bar, all of said follower members being supported for rotation on their cylindrical axes by the housing; and

said follower members and guide tracks frictionally engaged and defining means for movement of the bars in equal and opposite directions.

4,689,889

DEVICE FOR SUPPORTING A BUILDING LINE REFERENCE

Raymond A. Reeves, 9 Matravers Road, Great Malvern, Hereford & Worcester, England

Filed May 10, 1985, Ser. No. 733,235

Claims priority, application United Kingdom, May 19, 1984, 8412876

Int. Cl.[4] G01C *15/10*

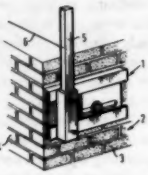
U.S. Cl. 33—408 **4 Claims**

1. A device capable of supporting a reference for a building line comprising:

a first member releasably attachable to a footing or wall structure, and

a second member releasably engageable with said first member whereby the relative position of said second member with respect to said first member is adjustable; said second member including a substantially vertically oriented hollow square section element having inner vertical walls and into which one end of a square section building line reference is in sliding engagement and threaded bolt holes provided at opposite ends of two adjacent walls thereof to

receive adjustable bolt means adapted to act on the end of the reference to vary the vertical orientation thereof and to lock the reference in said orientation, and said hollow element further including two protrusions projecting



inwardly of the two inner walls thereof opposite said adjacent sides, said protrusions extending substantially horizontally across said walls, and being positioned to face between said bolt holes in said adjacent walls.

4,689,890

DIGITAL DISPLAY MEASURING APPARATUS

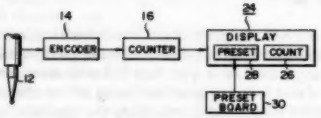
Shingo Nishina, Kanagawa, Japan, assignor to Mitutoyo Mfg., Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 590,194, Mar. 15, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 880,651

Claims priority, application Japan, Mar. 18, 1983, 58-46511

Int. Cl.[4] G01B *7/02*; G02F *1/133*

U.S. Cl. 33—504 **3 Claims**



1. A digital display measuring apparatus comprising a movable contact on the body of said measuring apparatus and adapted to engage an object to be measured, an encoder for converting the displacement of said contact into an electrical output signal, a counting circuit for counting said electrical output signal from said encoder, and a digital display for digitally indicating the counted value from said counting circuit, said measuring apparatus being characterized in that said digital display includes a measurement indicator display unit for indicating the displacement of said contact, a preset indicator display unit for only indicating a reference preset value of figures higher than those indicated on said measurement indicator display unit simultaneously with the indication of the displacement of the contact on the measurement indicator display unit, and a presetting means for supplying said reference preset value only to said preset indicator display unit, said presetting means comprising a presetting means activation means and a memory means for storing a predetermined reference preset value of figures higher than those indicated on said measurement indicating display unit and for supplying said reference preset value only to said preset indicator display unit when said presetting means activation means is actuated.

4,689,891

LOCATOR AND FIXTURE ASSEMBLY

Thomas R. Clark, 15400 Kellogg Rd., Bowling Green, Ohio 43402

Filed Oct. 31, 1986, Ser. No. 925,240

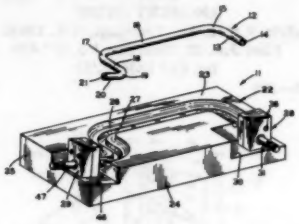
Int. Cl.[4] G01B *3/14, 5/20*

U.S. Cl. 33—529 **16 Claims**

1. A fixture assembly for inspecting a formed hollow tube for a predetermined configuration, comprising:

a base having a working surface with an envelope groove formed therein, said envelope groove having dimensions approximately equal to the maximum dimensions defining an error envelope for a formed hollow tube;

a locator block positioned at one end of said envelope groove and attached to said base;



a locator pin slidably mounted in said locator block and having one end adapted to engage a free end of a formed hollow tube positioned in said envelope groove; and

biasing means for urging said locator pin toward said one end of said envelope groove.

4,689,892

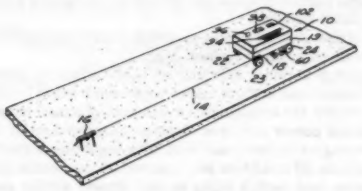
APPARATUS AND METHOD OF MEASURING SURFACE HEIGHTS

Thomas Kirven, Pomona, Calif., assignor to Kalman Floor Company, Evergreen, Colo.

Filed Jun. 17, 1985, Ser. No. 745,504

Int. Cl.[4] G01B *7/28*

U.S. Cl. 33—533 **15 Claims**



1. A method for using an inclinometer mounted on a vehicle to measure the height profile relative to gravitational level of a path upon a floor surface comprising the steps of:

determining a path along a floor surface;

mounting an inclinometer upon a vehicle which moves along the path;

calibrating the inclinometer, in order that an indicated level versus actual gravitational level of the inclinometer as mounted upon the vehicle may become known and corrected, by making oppositely directed runs of the vehicle along the path;

moving the vehicle along the path to make measurements with the inclinometer of the slope of the floor relative to gravitational level along the path;

sampling the slope measurements at predetermined intervals along the path; and

processing the sampled slope measurements to determine the floor height profile along the path at the predetermined points relative to a gravitational level.

4,689,893

APPARATUS AND METHOD FOR DRYING ELONGATED WEBS

Rudolph Behrens, Collegeville, Pa., assignor to BCD Dryers, Inc., Totowa, N.J.

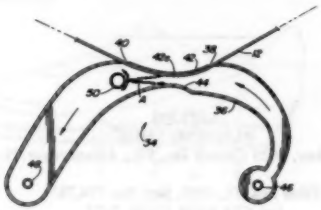
Filed Aug. 5, 1986, Ser. No. 893,225

Int. Cl.[4] F26B *13/02, 3/04*

U.S. Cl. 34—23 **18 Claims**

1. For use in association with apparatus for printing an

elongated web, web dryer apparatus comprising a hollow housing having a web inlet and a web outlet therein, guide means in said housing for conducting at least a portion of said web within said housing from said inlet to said outlet, means for admitting a gas stream to said housing and means permitting said gas stream to exit therefrom, airfoil means within said housing and disposed between said inlet and said outlet for



creating in said housing a region of reduced pressure in the vicinity of the web to induce evaporation from the web, said airfoil means comprising a passage having a wall defining an airfoil section, said portion of said web being in the flow of said gas stream as it passes over said airfoil section, and means in fluid communication with said housing for removing evaporated liquid from said housing.

4,689,894

CLOSED INTERMITTENT DRYING PROCESS

Sten O. Zeilon, Heimdalsgatan 21, S-260 14 Glumslöv, Sweden

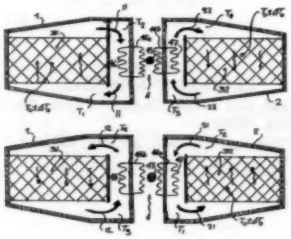
PCT No. PCT/SE85/00097, § 371 Date Oct. 23, 1985, § 102(e) Date Oct. 23, 1985, PCT Pub. No. WO85/04001, PCT Pub. Date Sep. 12, 1985

PCT Filed Mar. 5, 1985, Ser. No. 800,620

Claims priority, application Sweden, Mar. 6, 1984, 8401221

Int. Cl.[4] F26B *3/02*

U.S. Cl. 34—13 **14 Claims**



11. A closed intermittent drying process for drying moist material within a substantially gastight chamber, characterized in that the material is intermittently dried by means of a first gas flow circulated in a closed path in which the first gas flow is cooled and dehumidified and conducted through the moist material such that the necessary vapor dissipation heat for drying is taken from the latent heat of the moist material, and latent heat is restored to the moist material alternately with said drying by means of a second gas flow circulated in a closed path in which the second gas flow is heated and conducted through the moist material in such a manner that the moist material is heated but substantially no water vapor is transported from the material.

4,689,895

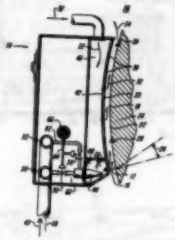
EVAPORATIVE-COOLING APPARATUS AND METHOD FOR THE CONTROL OF WEB OR WEB-PRODUCTION MACHINE COMPONENT SURFACE TEMPERATURES

Bruce F. Taylor, Auburn, Mass., and Kenneth G. Hagen, Cape Elizabeth, Me., assignors to Thermo Electron-Web Systems, Inc., Auburn, Mass.

Filed Feb. 28, 1986, Ser. No. 834,755

Int. Cl.[4] F26B *7/00*

U.S. Cl. 321—20 **18 Claims**



1. An apparatus for use in the non-contact cooling of a web or a machine component in contact with a web, said apparatus being positioned adjacent said web or component to be cooled, said apparatus comprising:

means for creating fog within said apparatus, said fog having a temperature lower than the temperature of said web or component to be cooled;

means for directing said created fog from said apparatus into a channel between said apparatus and the web or machine component, said directing means providing said fog to said channel so that said fog is applied to the surface of said web or machine component;

means for exhausting vapor from said channel, said vapor being created by the contact of said fog with said surface which causes evaporation of said fog, said exhausting means preventing the residual build-up of mositure on said web or machine component.

4,689,896

CLOTHES DRYER AND LAUNDRY SYSTEM

Rajendra K. Narang, 1525 Bonnie Rd., Macedonia, Ohio 44056

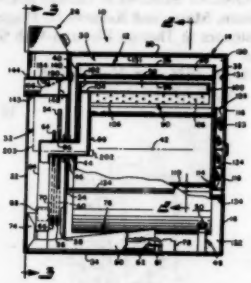
Filed Dec. 15, 1983, Ser. No. 561,882

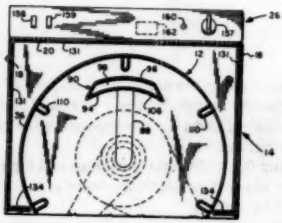
Int. Cl.[4] F26B *11/04*

U.S. Cl. 34—82 **14 Claims**

1. A clothes dryer comprising a housing, a cylindrical drum in said housing for receiving wet clothing, means for tumbling the wet clothing in said drum, blower means for generating air flow through said drum, heater means for heating the air prior to passage through said drum, and diffuser means located in said drum for receiving the heated air and discharging it into

said drum against the wet clothing at a plurality of locations spaced along the axial length of said drum, said diffuser means





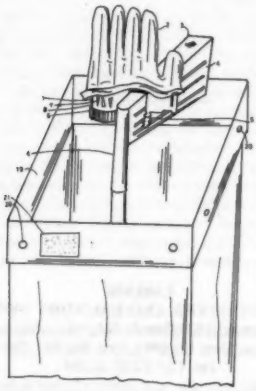
being located in the uppermost portion of said drum and having a plurality of downwardly directed air outlets.

4,689,897

COMPOSITE GLOVE DRYING DEVICE

Guy Marsalona, 11653 Hackberry St., Palm Beach Gardens, Fla. 33410

Filed Oct. 28, 1986, Ser. No. 923,900
Int. Cl.[4] F26B *9/10*
U.S. Cl. 34—103 **20 Claims**



1. A composite device for drying a wet glove and for containing liquid, solid and powdered materials, comprising:

a. an impermeable container having a shape generally conforming to the shape of a hand for holding a wet glove open to a drying atmosphere to enhance drying and to maintain the glove shape, said container having an opening to receive and dispense said materials;

b. resealable closure means formed at said opening to close said opening to retain said materials in said container; and

c. device attaching means connected to said container for removeably attaching said container to a support during the drying process.

4,689,898

RUNNING SHOE

Brian W. Fahey, 1620 Cornell Dr., SE., Albuquerque, N. Mex. 87106

Filed Sep. 11, 1985, Ser. No. 774,785
Int. Cl.[4] A43B *13/38, 7/22*
U.S. Cl. 36—43 **15 Claims**

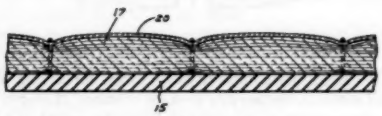
1. An inner sole for an article of footwear comprising a substantially planar, horizontal top surface adapted to support the bottom of a person's foot and having a raised bar extending above said top surface substantially across the width of said inner sole and arranged to contact a person's foot near the anterior surface of the calcaneus, said bar defining a substantially arcuate surface from the rear to the front of said bar so that said foot will roll over said bar during a running motion.

4,689,899

LAYERED INNER SOLE

Jon Larson, and Van Larson, both of 513 S. 6th St., Grand Forks, N. Dak. 58201

Filed Apr. 21, 1986, Ser. No. 853,934
Int. Cl.[4] A43B *13/40*
U.S. Cl. 36—44 **1 Claim**



1. For insertion into a shoe, an inner sole of layered construction, having in combination

a bottom cushion layer repellant to the penetration of moisture,

compression resistant insulating central layer of a relatively non-absorbent polyester micro-fibers, and

a top layer of a relatively thin non-woven highly porous absorbent non-wicking material which retains foot generated moisture until it is evaporated therefrom.

4,689,900

ANTISTATIC SHOE

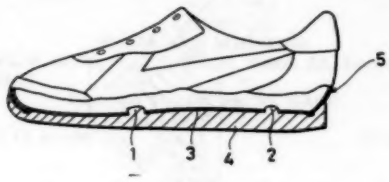
Tokujiro Ishibashi, Tokyo, Japan, assignor to Nippon Rubber Co. Ltd., Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,874

Claims priority, application Japan, Sep. 17, 1983, 50-143960[U]

Int. Cl.[4] A43B *13/00*

U.S. Cl. 36—103 **7 Claims**



1. An antistatic shoe comprising:

a sole;

an insole juxtapositioned relative to said sole, said insole including at least one aperture therein; and

at least one soft compression deformable antistatic projection corresponding to a medial plantar middle point disposed at a middle portion of a foot between the second toe bone and the third toe bone of the sole of a foot, said projection extending through said aperture in said insole;

said sole and said at least one soft antistatic projection being formed of an antistatic foam material so as to be integral therewith and said projection projects upwards to extend through said aperture and above the insole to be compressed and to engage a substantial portion of the medial plantar middle portion of a foot;

said at least one soft antistatic projection and the antistatic shoe sole are constructed of rubber that has an electric resistance value in a range of 1.0×10^5–1.0×10^8 ohm.

4,689,901

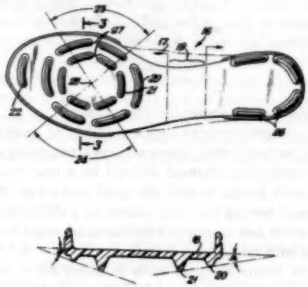
REDUCED TORSION RESISTANCE ATHLETIC SHOE SOLE

Frederick Ihlenburg, 1440 Chandler Rd., Lake Oswego, Oreg. 97034

Filed Oct. 19, 1984, Ser. No. 662,894

Int. Cl.[4] A43B *5/00*

U.S. Cl. 36—126 **11 Claims**



1. A shoe sole having a bottom face, instep, out step and toe portions, said toe portion including a plurality of vacuum limiting traction elements depending from the bottom face and arranged in a generally circular fashion about a point in a vertical axis at the balance point of the shoe sole, said depending elements including a first set more axially disposed, a second set more peripherally positioned adjacent the instep side of the toe portion and a third set more peripherally positioned adjacent the out step side of the toe portion, said first, second and third sets respectively depending first, second and third distances from said bottom face, wherein said first distance is greater than said third distance with the latter being greater than said second distance so that the bottoms of said first and second sets define an instep angle relative to said bottom face and the bottoms of said first and third sets define an out step angle relative to said bottom face with said instep angle being greater than said out step angle.

4,689,902

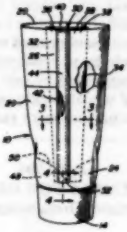
BREAKAWAY RIDING BOOT

Johnnie D. Lewis, Jr., Lubbock, Tex., assignor to Anthony E. Deprima, Phoenix, Ariz., a part interest

Continuation-in-part of Ser. No. 678,001, Dec. 3, 1984. This application Jul. 8, 1986, Ser. No. 883,162

Int. Cl.[4] A43B *5/00, 23/04, 11/00*

U.S. Cl. 36—131 **11 Claims**



1. A riding boot comprising a sole, a heel, and an upper defining a foot-receiving portion and a lower leg-receiving portion, wherein the lower leg-receiving portion of the upper has a lengthwise opening extending down the back of the boot from the top of the boot to the heel of the boot, and fastening means for releasably holding opposing edges of the upper defining the opening together during normal usage of the boot, and for breaking open in response to forces created in the boot if the wearer of the boot falls from a horse and the wearer's foot is caught in a stirrup so as to provide quick release of the wearer's foot from the boot, wherein the boot includes a heel insert having an upper edge which diverges downwardly toward its center and defines a central tip located substantially at the base of the lengthwise opening above an insole of the boot so as to allow a degree of up-and-down movement of the user's heel during normal walking while providing quick release of the fastening means in the event the user's heel rises above the tip and exerts outward pressure on the fastening means.

4,689,903

EARTH DIGGING MACHINE FOR USE ON SOFT OR UNDULATING TERRAIN, PARTICULARLY FOR THE CLEARING OF PONDS, SWAMPS OR CANALS

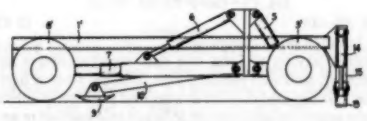
Bibaut Gilbert, 22, rue de Complègne, 60880 Le Meux, France

Filed Aug. 29, 1985, Ser. No. 770,588

Claims priority, application France, Sep. 3, 1984, 84 13585

Int. Cl.[4] E02F *5/02*

U.S. Cl. 37—103 **11 Claims**



1. In a soft terrain earth digging machine vehicle, especially

useful for clearing and dredging ponds, swamps, canals and the like, and naving a frame with four wheels attached to and supporting said frame on ground and defining a nominal wheelbase, and an automated shovel pivotally attached to said frame by a boom, the improvement comprising:

means, operatively associated with at least one pair of said wheels, for raising said one pair of said wheels from the ground;

a carriage attached for relative movement along a length of said frame, said carriage having a central stabilizer arm and means for engaging said arm with and disengaging said arm from the ground and said arm being sufficient with another pair of wheels, when said one pair of wheels are raised and said arm is engaged with the ground, to provide three point stable support of said vehicle on said ground; and

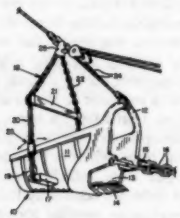
means, operatively associated with said carriage, boom and shovel, for actuating said carriage, boom and shovel are operable along with said wheel raising means so as to propel said vehicle, wherein said frame is supportable, alternately on said four wheels and on said three point support, and is shiftable relative to said carriage by engaging said shovel with said ground and moving said boom to propel said vehicle by moving said frame relative to said carriage, when supported by said three point support, on said other pair of wheels while said central stabilizer arm and carriage remain stationary relative to said ground.

4,689,904

RUB LINK ASSEMBLY FOR DRAGLINE BUCKET

Terry L. Briscoe, Portland, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Sep. 29, 1986, Ser. No. 912,270
Int. Cl.[4] F16G *15/04*; E02F *3/46*
U.S. Cl. 37—135 **12 Claims**



1. A rub link assembly for a dragline bucket adapted to be interconnected in a hoist chain for rolling movement against the bucket side comprising a relatively elongated member having a clevis at each end, each clevis being equipped with aligned openings adapted to receive bolt means for removably connecting said clevis to the hoist chain links, said member being further equipped with a cylindrical collar journaled thereon between said clevises and providing a rolling bearing against the bucket side.

4,689,905

COLLAPSIBLE LAUNDRY PRESS

Henri Vartan, 135 Seminary Dr., Apt. C, Mill Valley, Calif. 94941

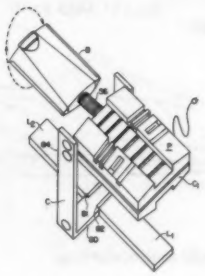
Filed Jul. 28, 1986, Ser. No. 891,436
Int. Cl.[4] D06F *71/02, 71/16*
U.S. Cl. 38—26 **11 Claims**

1. A laundry press comprising:

a cabinet having at least one side member and a upright member, said said member side foldable from a first position, closing said cabinet to a second position at substantial right angles to said cabinet to brace said cabinet in an erect position;

a buck movable from a first position interior of said cabinet upright member where it may be enclosed by a further member of said cabinet to a second position at substantial right angles to and supported from the top of said cabinet;

a pressing plate supported from said top of said cabinet upright member overlying said buck, said pressing plate



being movable towards and away from confrontation with said buck to press garments supported on said buck;

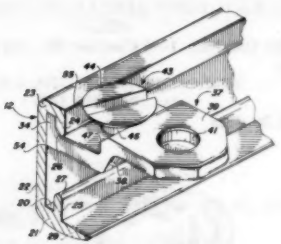
said buck and pressing plate mounted for reciprocation outwardly from said further member of said cabinet, said further member of said cabinet supported at 90° to said cabinet.

4,689,906

DISPLAY FRAME FOR MOUNTING VERTICAL SURFACE

Charles F. Sherman, Townsend, Mass., assignor to Esselte Pendaflex Corp., Garden City, N.Y.

Filed Aug. 21, 1985, Ser. No. 767,802
Int. Cl.[4] A47G *1/06*; G09F *1/12*
U.S. Cl. 40—152.1 **10 Claims**



1. Article display apparatus comprising:

a frame assembly comprising a plurality of joined elongated frame sections; each frame section comprising a longitudinally extending channel defined by a rear wall, a pair of side walls joined to said rear wall, and a pair of front wall lips each having one edge joined to a different one of said side walls and opposite edges spaced apart by a slot that opens into said channel; and

a pair of frame hangers each retained by a channel in a different one of said frame sections; each of said hangers comprising a latch arm portion extending into a portion of said channel defined by said rear wall, one of said side walls and one of said front wall lips, an inner end of said latch arm portion engaging said rear wall; a base portion having one end projecting out of said channel through said slot and joined to said latch arm portion, said one end engaging said opposite edge of said one front wall lip and said base portion defining a tapped hole; a lever portion extending from an end of said base portion opposite to said

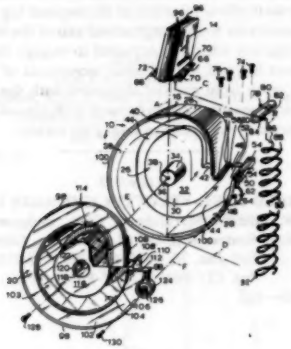
one end and defining an engagement surface; a fastener having a head and a threaded shank received by said tapped hole, said head comprising first and second diametrically opposed contact surfaces, said first contact surface engaging said engagement surface and said second contact surface engaging an outer surface of said one side wall; and retainer means adapted to retain one end of a frame supporting strand.

4,689,907

SMALL ARM MAGAZINE

Mack W. Gwinn, Jr., P.O. Box 61, Stetson Rd., Levant, Me. 04456

Filed May 14, 1986, Ser. No. 863,003
Int. Cl.[4] F41C *25/10*
U.S. Cl. 42—50 **17 Claims**



1. A small arm magazine for a small arm having a magazine well or the like comprising a generally drum shaped housing portion including cartridge guiding means located therein for guiding at least one column of cartridges in at least a partially curved manner, said cartridge guiding means having a substantially straight portion and having means for reducing friction with cartridges located in said cartridge guiding means, and projecting cartridge feeding means projecting outwardly from said generally drum shaped housing portion in a direction generally tangential to the outer portion of said generally drum shaped housing portion for fitting into and feeding cartridges into the magazine well of said small arm, said projecting cartridge feeding means having an outer upper end portion and a lower inner end portion with said lower inner end portion being located with respect to said generally drum shaped portion whereby a substantial portion of said generally drum qhaped housing portion is located at a level above the level of the lower inner end portion of said projecting cartridge feeding means when said small arm magazine is oriented for normal use.

4,689,908

HOLSTER AND HANDGRIP EXTENSION FOR MINIATURE HANDGUNS

Gary C. McClellan, 4011 Saddler La., Vale, Oreg. 97918

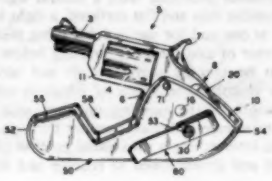
Filed Oct. 27, 1986, Ser. No. 923,189
Int. Cl.[4] F41C *23/00, 33/02*
U.S. Cl. 42—71.02 **10 Claims**

1. Holster and handgrip extension apparatus for miniature handguns of the type having a handgrip framework, to which handgrip side plates are removably attached, said framework defining an opening, said apparatus comprising:

pivot bolt support means engaging the handgrip framework of the handgun;

a pivot bolt laterally extending through said opening of said framework, said pivot bolt supported by said support means; and

a holster and handgrip extension member pivotally engaging



said pivot bolt, said member defining a handgrip extension when pivoted to an open operational mode and defining a holster covering the trigger and barrel of the handgun when pivoted to a closed non-operational mode.

4,689,909

MAGAZINE CHARGER

William J. Howard, P.O. Box 573, Wilson, N.C. 27893

Filed Jul. 16, 1986, Ser. No. 886,043
Int. Cl.[4] F42B *39/06*
U.S. Cl. 42—87 **11 Claims**

1. A magazine chargr for charging cartridges to a magazine; said magazine charger comprising;

A. a body comprising:

(1) an open end constituting means for receiving a magazine to be charged with cartridges; wherein the magazine has a magazine spring which biases cartridges toward two juxtaposed, cartridge-retaining lips carried by the magazine; and

(2) a closed end opposite the open end; and

(3) a saddle, the surface of which is lower than the cartridge-retaining lips of the magazine;

whereby insertion of a cartridge into the magazine causes the cartridge to slide along the saddle while remaining out of contact with the lips of the magazine; and

B. a plunger axially, slidably carried by the closed end of the body of the charger and adapted to move cartridges against the magazine spring; and

C. means for biasing the plunger away from the open end of the charger.

4,689,910

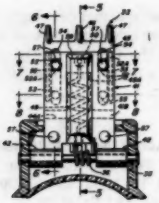
FRONT SIGHT FOR PROJECTILE LAUNCHERS

Paul V. Choate, Milton, and Robert W. Woodburn, Middleboro, both of Mass., assignors to N I Industries, Los Angeles, Calif.

Filed Mar. 6, 1986, Ser. No. 836,746
Int. Cl.[4] F41G *1/02*
U.S. Cl. 42—100 **6 Claims**

1. A thermally responsive front sight for a launcher of a

projectile the efficiency of the propellant of which varies with the temperature thereof, the launcher of a type having a port opening into a thermally insulated housing adjacent the muzzle and provided with a removable closure, said sight including a sighting member provided with a central sighting post, said sighting member thin and flat surfaced, a sight housing including means at one end for use in connecting said sight housing to the interior of said insulated housing below said port in a position to be erected therethrough and having a central lengthwise chamber the width of which is substantially less than the width of the sighting member, said sight housing having a transverse slideway opening through the other end thereof and intersecting a substantial portion of said chamber and shaped and dimensioned to receive and slidably confine



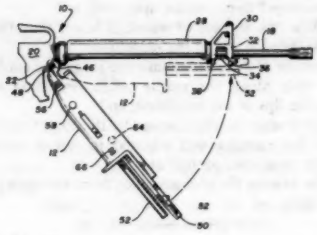
said sighting member, said sighting member within said slideway with a central portion exposed in said chamber and with the sighting post exposed above said housing, portions of the sighting member at each side of the chamber having lengthwise parallel slots, and a thermally responsive element within said chamber with one end anchored in the bottom thereof and the other end of the element attached to said exposed central portion, said element of the type expanding lengthwise as the temperature rises and contracting as the temperature falls, and means on each side of said chamber entrant of the appropriate one of the slots of the sighting member and dimensioned to enable said sighting member to be moved vertically by said element while holding said sighting member against lateral movement.

4,689,911

GRENADE LAUNCHER ATTACHMENT FOR INFANTRY WEAPON

Bernard C. White, Robbinsdale, Minn., assignor to Napco Industries, Inc., Hopkins, Minn.

Filed Jun. 4, 1984, Ser. No. 617,264
Int. Cl.[4] F41C *21/18*; F41F *1/06, 19/02*
U.S. Cl. 42—105 **4 Claims**



1. In combination with an infantry weapon having a bayonet lug mounted near the distal end of its barrel and projecting receiver bolts positioned at the forward portion of the rifle receiver on opposite sides thereof, a projectile launcher for firing individual projectile rounds comprising, in combination:

(a) a launcher body;

(b) a pair of hooklike projecting elements attached at one end of the launcher body for engagement of the projecting bolts on the rifle receiver to permit purely pivotal movement of the launcher body about the projecting bolts relative to the barrel of the infantry weapon and removal from the rifle without the use of tools when the launcher body is pivoted about the receiver bolts;

(c) a projecting tongue portion attached to the first end of the launcher and having locking means disposed thereon for engagement with the bayonet lug of the infantry weapon when the launcher body is pivoted about the receiver bolts into a position with the launcher body parallel to the barrel of the weapon;

(d) an opening in the projecting tongue portion positioned to receive the bayonet lug when the launcher body is pivoted into position parallel to the barrel; and

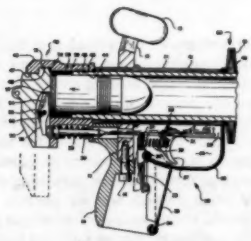
(e) pivotally movable engaging means including actuating arms and clamping jaws mounted on both sides of the opening constructed and arranged when actuated to open the jaws to allow insertion of the bayonet lug along an axis perpendicular to the longitudinal axis of the barrel into the opening and when not actuated to engage the step of the bayonet lug and resist pivotal movement of the launcher body away from parallel alignment with the barrel of the infantry weapon by interference with the widened step of the bayonet lug with the engaging means.

4,689,912

HAND-HELD HIGH-VELOCITY GRENADE LAUNCHER

Richard R. Gillum, Marblehead, Ohio, assignor to Weapon Technology System R & D Ltd., Westlake, Ohio

Filed Jun. 26, 1986, Ser. No. 878,673
Int. Cl.[4] F41C *15/08*; F41F *19/06*
U.S. Cl. 42—105 **6 Claims**



1. A hand-held, single-shot weapon for firing a high-velocity grenade round comprising:

a receiver;

stocks associated with said receiver for gripping said weapon for firing;

a barrel slidably received in said receiver and having an annular external shoulder spaced forwardly of said receiver;

annular recoil spring means surrounding a portion of said barrel and operatively located between said shoulder and the forward end of said receiver;

a breech connected to the rearward end of said barrel and defining with said barrel a firing chamber adapted to receive a grenade round to be fired;

a breech block received in said breech and manually slidable between an open position to permit end loading of a grenade round into said firing chamber and a closed position closing said firing chamber;

a firing lever pivotably mounted in said breech block about a transverse axis and having a first lever arm with a firing pin thereon axially aligned with said barrel and a second lever arm;

a striker slidably mounted in said receiver for movement in

a direction parallel to the axis of said barrel and adapted to engage said second lever arm of said firing lever; and

striker spring means urging said striker toward said second lever arm;

a sear engagable with said striker and movable in one direction to move said striker against said striker spring means;

trigger means including a trigger spring having one end engaging said sear;

cocking means operable by the user when gripping the weapon for firing, to move said sear in one direction to a cocked position and to cause said sear to compress said trigger spring; and

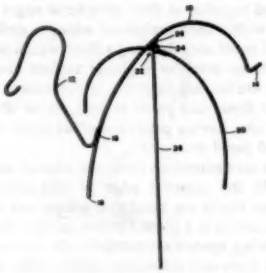
said trigger means being operable by the user to disengage said striker from said sear when said sear is in the cocked position whereby said striker means is moved into the cocked position only when the weapon is gripped for firing and when said striker means is released, said striker means impacts against said second lever arm to pivot said firing pin sharply to impact against and fire said grenade round.

4,689,913

COLLAPSIBLE DECOY

Ronnie V. Brice, R.R. 2, Box 487, Henryetta, Okla. 74437

Filed Jul. 9, 1986, Ser. No. 883,557
Int. Cl.[4] A01M *31/06*
U.S. Cl. 43—3 **6 Claims**



1. A collapsible fowl decoy consisting of:

a generally U-shaped first wire frame living in a single plane;

a U-shaped second wire frame lying in a single plane;

a neck extension fixed to said second wire frame and lying in said single plane;

the only frame lies wholly in said single plane;

a pivot means for pivotally connecting an intermediate point on said first wire frame and an intermediate point on said second wire frame such that the wire frames can be rotated between an enhanced position and a collapsed flat position, there being no connection between said first wire frame and said second wire frame other than said pivot means;

a flexible covering over said first and second wire frame and said neck extension;

a ground anchor rod connected to said second frame.

4,689,914

VARIABLE BUOYANCY FISHING LURE

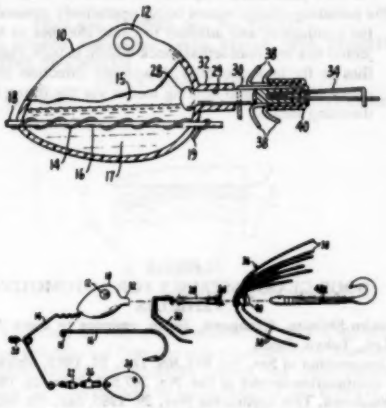
Leland F. Quinlan, Rte. 1, Box 14A, Westwood, Calif. 96137

Filed Aug. 28, 1985, Ser. No. 770,661
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.22 **13 Claims**

8. A fishing lure comprising:

a hollow, resilient head member having a vent opening in communication with the interior of said head member;

adjustment means for adjusting the specific gravity of said lure by manually collapsing and releasing said head member, said adjustment means including a relatively rigid plug having a first end disposed within said vent opening; and



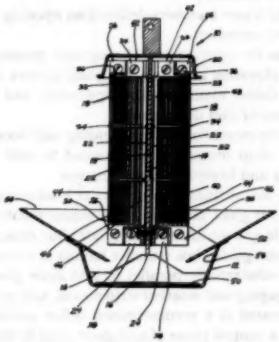
a hook having a hook shank which extends through said head member and a barb which is biased against a second end of said vent plug by said head member.

4,689,915

TRAP FOR HOUSEFLIES

Roger H. Grothaus, and Donald W. Hildebrandt, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed May 7, 1984, Ser. No. 607,371
Int. Cl.[4] A01M *1/22*
U.S. Cl. 43—112 **11 Claims**



1. A trap for trapping flies and flying insects of comparable size, comprising:

an upright array of substantially parallel, exposed conductors, said conductors being of insufficient width to allow an adult fly to easily alight on only one conductor, wherein adjacent pairs of said conductors are separated by air and closely spaced such that an alighting fly contacts an adjacent pair of conductors;

insect receiving-and-holding means below said array for receiving and holding insects;

flying insect-directing means disposed adjacent the lower end of said array and above said receiving-and-holding means for directing generally downwardly flying insects into contact with said receiving-and-holding means; and

pulsing-charge means for periodically generating opposing pulsating charges and delivering such charges to adjacent pairs of said conductors, said charges having about 25 to 40 volts peak and a frequency of about 60 to 600 Hz,

the pulsating-charge means being operatively connected to the conductors and adapted to cause the flies to be subjected to a less-than-lethal shock which, in turn, causes the flies to fly in a generally downward direction into the insect receiving-and-holding means via the flying insect-directing means.

4,689,916

DOOR GLASS ASSEMBLY FOR AUTOMOTIVE VEHICLES

Yoshiro Shimizu, Kanagawa, Japan, assignor to Isuzu Motors Ltd., Tokyo, Japan

Continuation of Ser. No. 561,369, Dec. 14, 1983, which is a continuation-in-part of Ser. No. 247,574, Mar. 26, 1981, abandoned. This application Nov. 29, 1985, Ser. No. 802,959

Claims priority, application Japan, Mar. 31, 1980, 55-42884; Mar. 31, 1980, 55-42885; Mar. 31, 1980, 55-42886; Apr. 28, 1980, 55-58646; Apr. 28, 1980, 55-58647

Int. Cl.[4] E05F *11/38*

U.S. Cl. 49—374 **6 Claims**

1. A door glass assembly for an automobile door comprising:

a door body member;

top and side frame members defining an opening within said door body member;

a door glass for opening and closing said opening;

door glass elevating and lowering guide groove means fixed to said frame members for supporting and permitting movement of said door glass;

weather strip means for slidably guiding said door glass, said weather strip means being mounted in said door glass elevating and lowering groove means;

guide shoe means fixedly secured to at least one end portion of said door glass, said guide shoe means slidably engaging said guide groove means, said guide shoe means including at least one guide shoe member having at one end a guide portion substantially parallel to said door glass and slidably engaging said weather strip means, said guide portion being located at a predetermined offset portion with respect to a central plane of said door glass to fair said door glass with a door outer panel, a first extension on a passenger compartment side, a second extension on the outside and a connecting portion therebetween defining a U-shaped channel for clamping an end portion of said door glass, an adhesive applied to portions corresponding to said first extension and said connecting portion of said guide shoe member, said second extension being shorter and thinner than said first extension;

said guide shoe member is made of plastic by integrally molding; and

said end portion of said door glass is pressingly inserted into said clamping portion whereby said door glass is fixedly secured to said clamping portion, and the surface of said door glass and said door body member are made substantially flush.

4,689,917

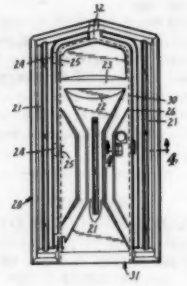
BUILDING WALL PANEL AND DOOR UNIT

Phillip R. Juaire, Brooklyn Center; Frederic M. Wagner, Rogers, and Leo F. Wildgen, Bloomington, all of Minn., assignors to Satellite Industries, Inc., Minneapolis, Minn.

Division of Ser. No. 566,582, Dec. 29, 1983, Pat. No. 4,574,025. This application Sep. 30, 1985, Ser. No. 782,294

Int. Cl.[4] E06B *1/00*

U.S. Cl. 49—380 **7 Claims**



1. A generally rectangular, building-wall panel comprising:

an interior polymeric sheet and an exterior polymeric sheet bonded together at their peripheral edges and at selected areas within their peripheral edges to define a panel,

a central panel area defining a door which is bordered on at least three sides by a planar surface area wherein said sheets are bonded together, which central panel area may be cut from said panel in said planar area, said central panel area having patterned offset areas to reinforce said central panel area, and

an offset area extending from one edge of said central panel area to the adjacent edge of said panel wherein said molded sheets are bonded together and one side of said offset area is at a plane parallel to the other side, said one side being spaced substantially the thickness of said two sheets from said other side, which offset area may be cut at its midpoint to separate said panel whereby the one and said other side may be placed in overlapping relationship to form a frame smaller than said central panel area, said offset and overlap provides said frame in one plane from said surface area adjacent the central panel area.

4,689,918

APPARATUS FOR MANUFACTURING AND WORKING OF GEARS

Herbert Loos, Dorfen-Stadt, and Manfred Erhardt, Puchheim, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen-und Zahnradfabrik Gmbh & Co., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 576,672, Feb. 3, 1984, abandoned. This application Jan. 6, 1986, Ser. No. 816,946

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304980; May 17, 1983, 3317915; Nov. 18, 1983, 3341671; Nov. 19, 1983, 3341877

The portion of the term of this patent subsequent to Jul. 29, 2003, has been disclaimed.

Int. Cl.[4] B24B *19/00*

U.S. Cl. 51—105 GG **12 Claims**

1. An apparatus for the precision working of a tooth system of a rotatably supported gearlike workpiece by rolling the teeth of said gearlike workpiece with teeth on a rotatably supported gearlike tool, the axes of rotation of said workpiece and said tool being spaced along a common normal, comprising:

support means supporting said rotatably supported workpiece and tool for movement only toward and away from

each other in a direction parallel to said common normal and so that said axes of rotation thereof are crossed;

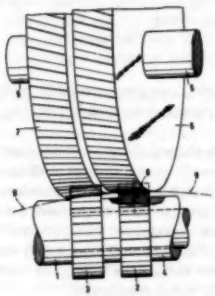
first guide gear means coaxially coupled to said workpiece and being rotatable therewith;

second guide gear means coaxially coupled to said tool and being rotatable therewith, said first and second guide gear means operatively engaging each other and having the same speed ratio therebetween as between said workpiece and said tool;

abrasive surface means on said teeth of said tool, said tool teeth being free of uniformly directed cutting edges, said tool further being formed hyperboloidally in the axial dimension thereof so that when said workpiece and said tool are engaged, at least one of said teeth of said tool is engaged by at least one of said teeth on said workpiece over the entire axial length of the tool tooth;

first means providing a first tooth contact between successive teeth on said tool and successive teeth on said workpiece on only one side of each of said successive teeth on said tool, a first backlash spacing being provided between each of said successive teeth on said workpiece and the opposite side of each of said successive teeth on said tool;

second means providing a second tooth contact, simultaneous with said first tooth contact, between successive teeth on said first guide gear means and successive teeth on said second guide gear means on only side of said of said successive teeth on said second guide gear means, a



second backlash spacing being provided between each of said successive teeth on said first guide gear means and the opposite side of each of sdid successive teeth on said second guide gear means, said first tooth contact being on a first circumferentially facing side of each said successive tooth of said workpiece and said tool, said second tooth contact being on a second circumferentially facing side of each said successive tooth of said first and second guide gear means, said first circumferentially facing side facing oppositely to a facing direction of said second circumferentially facing side so that the operatively engaged combination of said workpiece/tool and said first guide gear means/second guide gear means is entirely backlash free;

drive means for driving said workpiece/tool pair and said guide gear pair for continous rotation during an interval of time that work is being performed by said tool on said workpiece;

said first and second means including an adjusting means for effecting a change in the side on which tooth contact is provided from one circumferentially facing side to the opposite side and during said continuous rotational driving of said workpiece/tool pair and said guide gear pair so that said rotation of said workpiece/tool pair and said guide gear pair is continuous during a cycle of operation including a change in the side on which tooth contact is provided between said workpiece/tool pair and said guide gear pair.

4,689,919

METHOD FOR WELDING CUTTER SEGMENTS

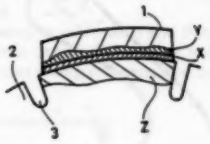
Takao Kawakita, Ikeda, and Ichiro Miyao, Fujieda, both of Japan, assignors to Osaka Diamond Industrial Co., Sakai, Japan

Filed Apr. 24, 1985, Ser. No. 726,517

Claims priority, application Japan, May 8, 1984, 59-92518; May 8, 1984, 59-67635[U]

Int. Cl.[4] B24D *5/06*

U.S. Cl. 51—206 P **17 Claims**



1. In a method for fixing to a steel core body a segment containing grit selected from the group consisting of diamond, cubic boron nitride and mixtures thereof, the improvement comprising the steps of using as the material of said segment, a cobalt powder compact, containing said grit, which has been sintered to nearly 100% apparent density, and welding said segment to said steel core body by focusing an electron beam or a laser beam on the boundary between said steel core body and said segment.

4,689,920

SLITTING TOOL

Samuel C. Geise, Memphis, Tenn., assignor to Specialty Tool Co., Inc., Memphis, Tenn.

Filed Aug. 18, 1986, Ser. No. 897,724

Int. Cl.[4] B24B *19/00*

U.S. Cl. 51—241 S **7 Claims**

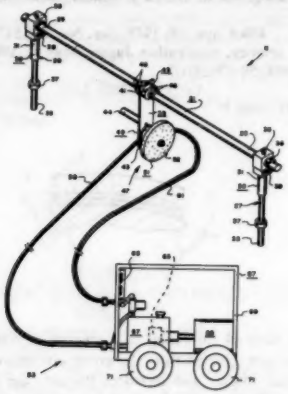
1. A tool for cutting a slit into at least one web portion of one end of a membrane wall, said tool comprising:

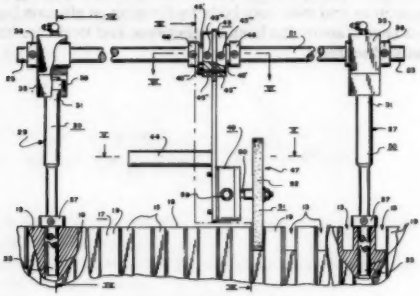
(a) a guide bar;

(b) securing means for securing said guide bar to said membrane wall at a location above said one end of said membrane wall;

(c) a swing arm having a first end attached to said guide bar and having a second end swingable between a first position and a second position; and

(d) cutting means attached to said second end of said swing arm for cutting a slit into said at least one web portion of





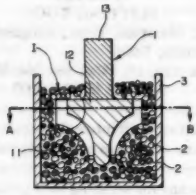
said membrane wall when said swing arm is moved between said first and second positions.

4,689,921

PROCESS OF CONTOURING THE EDGES OF A CERAMIC ROTOR

Shigenori Murate, and Yoshinori Hattori, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Nov. 12, 1985, Ser. No. 796,714
Claims priority, application Japan, Nov. 13, 1984, 59-239184
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—317 **11 Claims**



1. A method of shaping the edges of a sintered ceramic turbine rotor, said method comprising the steps of:

providing a plurality of grindstones having a diameter in the range of from about 1 to 10 mm;

placing said rotor in said grindstones; and

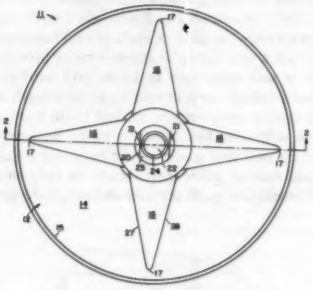
rotating said rotor within said grindstones such that the radius of the edges of said rotor is in the range of about 0.2 to 1 mm.

4,689,922

BUFFING PAD

Walter W. Blanchard, Jr., 411 Lake Shore Dr., Duxbury, Mass. 02332

Filed Feb. 18, 1986, Ser. No. 830,627
Int. Cl.[4] B44D *1/00*
U.S. Cl. 51—358 **12 Claims**



9. A light-weight, one-piece portable buffing pad for use with a hand-held power drive member having a threaded shaft comprising:

a generally disk-shaped, flexible, solid, plastic backing plate having a generally planar central portion and an integrally formed peripheral lip of a thicknessnless than the thickness of saidi planar central portion, said lip being of a predetermined curvature thereby forming a generally concave inner surface and a generally convex outer surface, said outer surface, including the outer surface of said peripheral lip, being roughened;

a tufted pad;

means for permanently glueing said tufted pad to said outer surface of said backing plate including said peripheral lip;

means for releasably connecting said backing plate directly to the threaded shaft of the power drive means, said connecting means being integrally connected to the center of said central portion of said inner surface and including a top portion for forming a stop with the power drive means; and

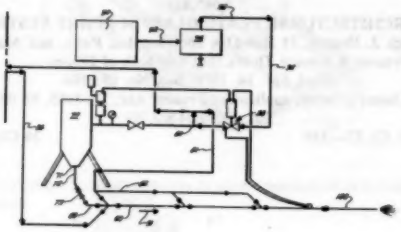
four control ribs symmetrically disposed at 90° intervals and integrally formed on said central portion of said inner surface of said backing plate and extending from said connecting means in a radial direction toward the peripheral lip of said backing plate, each of said control ribs decreasingly tapering in both width and thickness from said connecting means toward the peripheral lip of said backing plate, with said control ribs having their greatest thickness and width at the connecting means, and their least thickness and width at a point near said peripheral lip, with said taper being continuous from said connecting means to said point near said peripheral lip, said control ribs providing increased flexibility to said backing plate toward the peripheral lip of said backing plate and said inner surface of said backing plate having unobstructed pathways between said ribs for directing debris particles in a generally centrifugal direction when the buffing pad is driven by the power drive member.

4,689,923

SLURRY SANDBLASTING SYSTEM

James L. Goudeaux, 450 Vitrano La., Independence, La. 70443, and Eric J. Olivier, 1406 Hwy. 311, Schriever, La. 70395

Filed May 7, 1985, Ser. No. 731,670
Claims priority, application PCT Int'l Appl., Jul. 29, 1985, PCT/US85/01417
Int. Cl.[4] B24C 3/02
U.S. Cl. 51—410 1 Claim



1. An apparatus for sandblasting while maintaining consistent pressure in the sandblasting line, the apparatus comprising:

a. a source of pressurized gas;

b. a source of water in a tank;

c. a source of abrasive material;

d. a principal flow line in communication with the source of sand and pressurized air for delivering the sand under pressure within the principal flow line;

e. means for injecting a chemical inhibitor into the water tank;

f. first means along said principal flow line for introducing the water containing inhibitor into the sand flowing in the principal flow line, said means further comprising a principal flow chamber for accommodating the sand flow in said principal flow line;

g. first and second injection ports located in the wall of said chamber for allowing water containing chemical inhibitor and air to flow into said principal flow chamber through said first and second ports respectively; and

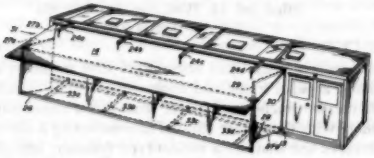
h. means situated at points along the length of said principal flow line for providing an air pressure boost within the line, said means including an angulated orifice for introducing said air into said principal flow line under pressure in the direction of said main flow in said flow line.

4,689,924

EXPANDABLE STRUCTURE AND SEQUENCE OF EXPANSION

Bruce A. Jurgensen, 3412 - 17th Ave., Forest Grove, Oreg. 97116

Filed May 30, 1985, Ser. No. 739,607
Int. Cl.[4] E04B 1/344; E04H 1/12
U.S. Cl. 52—67 15 Claims



1. An expandable structure, comprising:

a core structure having a roof section, sidewall sections, endwall sections and a floor section;

a plurality of structural members hinged to a frame of said core structure and vertically stacked adjacent a selected one of said sidewall sections, a substantial portion of said selected sidewall section being hinged to said frame of said core structure, said selected sidewall section being rotatable outwardly to form the roof of a contiguous expanded structure, said structural members being capable of deployment subsequent to said deployment of said selected sidewall, to form a window wall, end walls and the floor of said contiguous expanded structure;

power beam means housed within said roof section of said core structure to drive said selected sidewall/roof outwardly to form said roof of said contiguous expanded structure; and

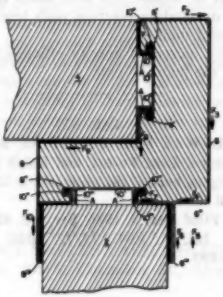
power beam means housed within said floor section of said core structure to deploy said window wall, end walls and said floor of said contiguous expanded section.

4,689,925

IN A BUILDING A CORNICE BETWEEN A WALL AND A CEILING BOTH MADE OF MODULAR PANELS

Luigi Granieri, Pantalla, Italy, assignor to GN/PI de Luigi Granieri e Figli, S.n.c., Perugia, Italy

Filed Sep. 23, 1986, Ser. No. 910,725
Claims priority, application Italy, Sep. 25, 1985, 36192/85[U]
Int. Cl.[4] E04B 7/00; E04D 3/40
U.S. Cl. 52—94 3 Claims



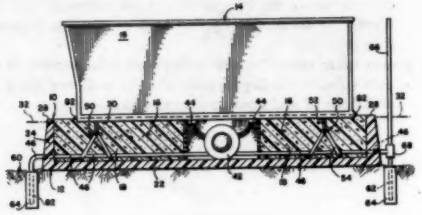
1. A protective peripheral cornice of a building wherein the walls and the top roof are both formed with modular panels of common dimensions a cornice that is an equal angle broad flanged beam is inserted between the top of the wall and the end section of said roof which cornice with its inner surface of its vertical flange covers the end of the ceiling and with its inner surface of its horizontal flange covers the terminal section of the ceiling; while the outer surface of its horizontal flange covers the top surface of the wall and projects from the latter for about ¼ of the wall thickness while the outer surface of the vertical flange is exposed to the atmosphere, said cornice being made of light material which is totally enveloped in a metal sheet except for two interruptions where the sheet is replaced by bridgelike means of insulating plastic material which extend for about ½ the panel thickness; one of said interruptions being located across the horizontal median plane of the ceiling panel while the other is located across the vertical median plane of the wall panel.

4,689,926

FOUNDATION FOR BUILDING STRUCTURE AND METHOD OF CONSTRUCTING BUILDING STRUCTURE UTILIZING SAME

J. Kevin McDonald, 6452 Briarway Cove, Memphis, Tenn. 38115

Filed Feb. 5, 1986, Ser. No. 826,182
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—169.11 44 Claims



1. A foundation for a mobile building unit having wheels, the foundation comprising:

(a) a shell having side walls said shell being of such size and configuration as to underlie the building unit and provide a base on which the building unit is supported, said shell partially defining a space between itself and the building unit, and

(b) an insulating filling in said shell, said insulating filling being of such volume and shape as to fill said space between said shell and the building unit,

(c) said side walls of said shell being resiliently movable between a bent condition, allowing the wheels of the mobile building unit to pass over said side walls to move the mobile building unit into or out of place, and a relaxed condition in which said side walls have resumed their normal, upstanding position with respect to said bottom wall of said shell,

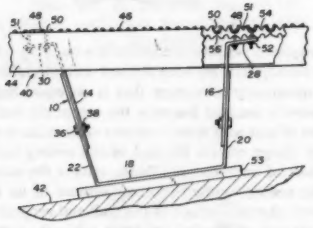
(d) whereby increased energy efficiency and stability are provided for the building unit.

4,689,927

WALKWAY FOR A SLOPING ROOFTOP

William J. Green, Lake Forest, and Ralph P. Semmerling, Arlington Heights, both of Ill., assignors to USG Industries, Inc., Chicago, Ill.

Filed Dec. 3, 1986, Ser. No. 937,324
Int. Cl.[4] E04D *13/12;* E04G *3/00*
U.S. Cl. 52—180 4 Claims



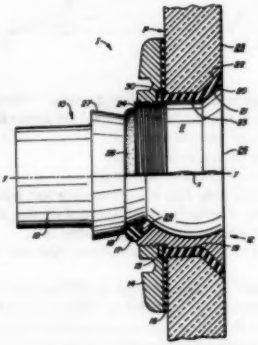
1. A rooftop walkway comprising a longitudinal, expanded metal plank disposed at an acute angle to the roof on which the walkway rests, and an adjustable, U-shaped support stand to which the plank is fastened transversely; the support stand comprising a base, a pair of divergent legs connected to the base, and an extension member connected to each leg; each leg having a plurality of holes arranged in at least two spaced apart columns, and each extension member having a web and an outwardly extending flange connected to the plank, the webs having a pair of slots spaced apart in correspondence with the columns, wherein the slots in the extension members are aligned with the holes in the legs so that the base of the support stand and the flanges of the extension members are in different planes.

4,689,928

ARCHITECTURAL PLATE GLASS SUPPORT SYSTEM

Hugh J. Dutton, 31 Rue Des Thermopyles, Paris, and Martin Francis, 6 Avenue Thiers, Antibes, both of France

Filed Apr. 14, 1986, Ser. No. 851,196
Claims priority, application France, Apr. 15, 1985, 85 06179
Int. Cl.[4] E04B *1/40*
U.S. Cl. 52—235 24 Claims



1. A mechanical joint for supporting a vertically oriented plate comprising:

a stem having first and second ends;

a head having reduced sized first end and enlarged sized second end;

articulated means for mounting the head to the second stem end for articulated movement relative to the stem;

said first end of said stem and said head sized to pass through a hole in the plate, said second head end sized to prevent said head from passing completely through the hole in the plate; and

means for securing the plate to said head.

4,689,929

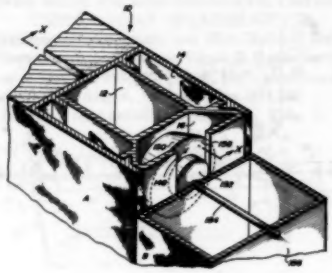
FASTENER FOR A READILY DISENGAGEABLE INTERIOR PANEL

James D. Wright, 110 Pennsylvania Ave., Bangor, Pa. 18013

Filed Jul. 21, 1986, Ser. No. 888,054
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—239 4 Claims

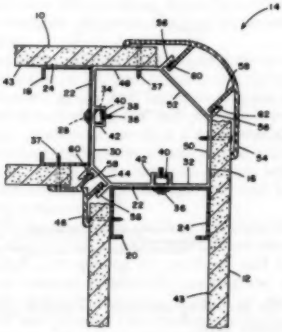
1. A pair of snap fitted rigid linear strut members together defining a panel frame end comprising a male member, said male member including a linear shaft and a linear trapezoidal channel with the longer parallel side including a slit midpoint to receive the shaft of a button-type fastener, said channel's short parallel side forming said shaft's top side, said shaft having a total of three sides with an open bottom, said other two sides being formed by parallel arms projecting from said trapezoid short side corners and wherein, also, said nonparallel sides of said channel each include an outward projecting horizontal flange, and a female member, said female member defining part

of said panel edge so that a fabric panel cover surrounding at least a portion of said female member is internally held by said



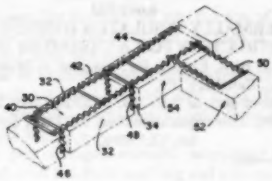
male member to thereby cover at least a portion of said female member.

4,689,930
PARTITION STRUCTURE
Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.
Filed May 29, 1986, Ser. No. 868,247
Int. Cl.[4] E04B *1/348, 1/56*
U.S. Cl. 52—277 **4 Claims**



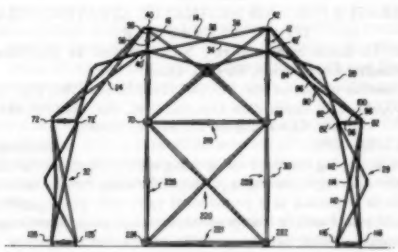
3. A partition wall comprising a plurality of sections adjoined together by a plurality of vertically spaced apart clips, each said clip being affixed to a vertical stud located at substantially the end of each of said plurality of sections of wall, said clips therein comprising a relatively short length of a hollow tubular preformed rigid section of substantially uniform cross section, said preformed rigid section including a plurality of stud-engaging flat sides, each said stud-engaging flat side having means for firm attachment to a stud of a partition wall section, said preformed rigid section further including at least two additional sides having means for firm attachment thereto of elongate clip-concealing trim strips, wherein said means for attachment to a stud in each stud-engaging flat side comprises a screw threadedly affixed to said clip with a screw-head located externally of said clip for engaging screw-head holding means of abutting studs, and wherein said means for attachment to a stud in each stud-engaging flat side further comprises a nut threadedly engaged by said screw and means for preventing rotation of said nut when said screw is rotated therein.

4,689,931
MASONRY CONSTRUCTION DEVICE
Philip R. Hodges, P.O. Box 1617, Petersburg, Va. 23805
Filed Mar. 3, 1986, Ser. No. 835,773
Int. Cl.[4] E04C *5/16*
U.S. Cl. 52—442 **11 Claims**



1. An interlocking spacer device adapted to be disposed between adjacent masonry elements for spacing the masonry elements a predetermined distance apart, the device being U-shaped and being formed by first and second elongated members which are corrugated over substantially their entire length and spaced apart in respective first and second parallel planes, and by a third straight member connected to the first and second members and extending substantially perpendicular to the first and second planes, the third member being formed of two telescoping sections so that the spacing between the first and second members may be varied, each member comprising a rod of circular cross-section and uniform diameter, and the first and second members each being formed to have in its respective plane a sawtooth shape which provides, on one side of the member, a plurality of first ridges and valleys alternating along the length of the member and, on an opposite side of the member, a plurality of second alternating ridges and valleys, the first and second ridges being spaced apart in the plane of the member by said predetermined distance and providing a plurality of bearing surfaces for engaging and spacing corresponding first and second adjacent masonry elements, and wherein the diameter of said members is less than a distance in said planes between the ridges and alternating valleys such that a member of another U-shaped device may cross one of the first and second members at an angle and be received within a valley between adjacent ridges to interlock the U-shaped devices together with the ridges of said U-shaped devices at substantially the same levels.

4,689,932
PORTABLE SHELTER ASSEMBLIES
Theodore R. Zeigler, 205 S. Columbus St., Alexandria, Va. 22314
Filed Nov. 6, 1985, Ser. No. 795,534
Int. Cl.[4] E04H *12/00*
U.S. Cl. 52—648 **41 Claims**



1. In a portable shelter framework formed of elongate struts

and which is capable of being expanded into arched three dimensional form and collapsed into bundled form, the combination of a plurality of series of end-interconnected modules each defining a separate arch portion of the framework, said arch portions extending in different directions relative to each other.

4,689,933

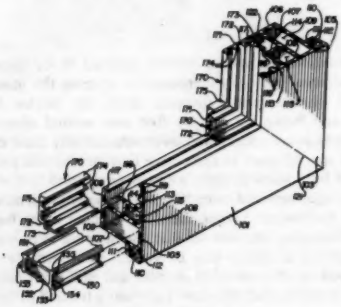
THERMALLY INSULATED WINDOW SASH CONSTRUCTION FOR A CASEMENT WINDOW

Alexander J. Biro, Export, Pa., assignor to Winchester Industries, Inc., Saltsburg, Pa.

Continuation-in-part of Ser. No. 632,910, July 20, 1984, Pat. No. 4,624,091. This application Aug. 29, 1986, Ser. No. 902,426

Int. Cl.[4] E04C *2/38*

U.S. Cl. 52—656 **23 Claims**



1. A window sash member comprising:

first and second generally parallel sidewalls;

first and second spaced, generally parallel transverse walls connecting said first and second sidewalls, extending between and oriented generally perpendicular to said first and second sidewalls to define a first hollow chamber;

a third transverse wall, located without said first hollow chamber adjacent to and generally parallel to said first transverse wall, extending from said first sidewall and terminating short of said second sidewall;

a first interior wall extending from said third transverse wall to said first transverse wall and oriented generally parallel to said first sidewall to define a second hollow chamber;

a fourth transverse wall, located without said first hollow chamber adjacent to and generally parallel to said second transverse wall, extending from said first sidewall and terminating short of said second sidewall; and

a second interior wall extending from said fourth transverse wall to said second transverse wall and oriented generally parallel to said second sidewall to define a third hollow chamber.

4,689,934

APPARATUS FOR AND METHOD OF APPLYING WRAP TO ARTICLE CLUSTERS

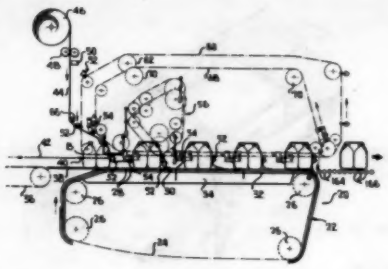
Robert H. Ganz, Saddle River, N.J., assignor to The Mead Packaging Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 709,724, Mar. 8, 1985, Pat. No. 4,633,647. This application Oct. 16, 1985, Ser. No. 788,034

Int. Cl.[4] B65B *21/24, 49/10, 49/14*

U.S. Cl. 53—398 **26 Claims**

1. A wrapping machine comprising a web supply, an article transport conveyor having a platform defining run for moving articles in sequence at a preselected rate, web pulling means carried by said article transport conveyor at preselected regular spacing, plural article retarder means for movement in advance of articles being wrapped and in overlying relation to said platform defining means at a rate less than said preselected rate, means for separating said web supply into separate web portions and plural article clamp means for movement in overlying relation to said platform defining means behind articles



being wrapped and for cooperation with said article retarder means to fixedly clamp a separated web portion to each article being wrapped.

4,689,935

ANTISEPTIC GLOVE

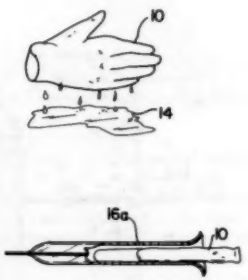
Audrey E. Harding, 1087 Cork Dr., Bethel Park, Pa. 15102

Filed Feb. 25, 1987, Ser. No. 118,775

The portion of the term of this patent subsequent to Nov. 1, 1993, has been disclaimed.

Int. Cl.[4] B65D *81/22*

U.S. Cl. 53—431 **2 Claims**



1. A method for providing sterilized protective gloves including the following steps,

(a) immersing a saturable glove capable of fully enclosing a wearer's hand and adapted to cover separately each of a wearer's fingers and thumb in a solution having antiseptic qualities to saturate the said glove with said solution,

(b) removing said saturable glove from said solution,

(c) draining said glove of excess solution to provide a glove saturated with said antiseptic solution,

(d) inserting said saturated glove between two layers of material having leakproof qualities,

(e) sealing peripheral portions of said material to totally encapsulate said saturated antiseptic glove,

(f) shearing said peripheral portions of said material that encapsulates said glove to expose for use by the wearer of the glove, said glove being saturated when removed and worn thereby providing the wearer with a hygenic glove saturated with said antiseptic solution which fully encloses the hand and separately covers each of a wearer's fingers and thumb and which will not allow contamination of said wearer's hands during the performance of routine operations.

4,689,936
PROCESS FOR THE PACKAGING OF PRODUCTS, USING A HEAT TREATMENT, AND CLOSED CONTAINER WITH PACKED PRODUCTS, OBTAINED USING A HEAT TREATMENT

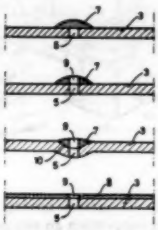
Gjalt M. Gaikema, Dedemsvaart, and Dirk Zylstra, Bathmen, both of Netherlands, assignors to Wavin B.V., Netherlands

Continuation of Ser. No. 698,440, Feb. 5, 1985, abandoned. This application Aug. 6, 1986, Ser. No. 894,507

Claims priority, application Netherlands, Feb. 6, 1984, 8400366

Int. Cl.[4] B65B *63/08, 55/14*

U.S. Cl. 53—440 **8 Claims**



1. A process of packaging heat-treated products, particularly foods, comprising the steps of:

filling a container with a specific quantity of product to be packed;

closing said container, said closed container having a wall which is not resistant to substantial overpressures and is provided with at least one pressure balancing vent opening, said vent opening being closed by a solidified drop of a heat meltable polymer adhering to the surface of the container;

subjecting said container with its contents to a heat treatment, the size of the vent opening and the melting point and viscosity of the heat meltable polymer having been selected in such a way that said polymer is melted during said heat treatement but does not substantially flow into the container during heat treatment and wherein gaseous products formed in the container during said heat treatment are able to escape through said vent hole and said meltable polymer, and;

cooling the container after said heat treatment thereby solidifying said melted polymer and hermetically sealing sid balancing vent opening by means of said heat-meltable polymer without substantially sucking the drop of heat meltable polymer into the interior of the container, wherein said polymer has a melting point lower than the temperature of the heat treatment.

4,689,937
ARTICLE BAGGING UNIT

Anthony T. Finan, Sr., 9640 Wissinoning St., Philadelphia, Pa. 19114; Richard K. Lowery, Sr., 1304 Sturbridge Dr., and Walter T. Leible, 915 Roberts Rd., both of Warminster, Pa. 18974

Filed Sep. 8, 1986, Ser. No. 904,896

Int. Cl.[4] B65B *1/32*

U.S. Cl. 53—502 **15 Claims**

1. An article bagging unit comprising:

means for storing a strip of bags interconnected by perforated lines extending between the top edge of the back of each bag and the bottom of the next bag;

means for storing articles to be deposited in said bags;

a dispensing compartment within which said bags are filled with said articles;

means for delivering said articles to said dispensing compartment;

means for feeding said bags to said dispensing compartment and for positioning said bags to receive said articles from said article delivering means;

means for opening a bag positioned in said dispensing compartment to receive articles from said article delivering means and for closing and sealing a bag filled with said articles, said bag opening, closing and sealing means including:

(a) an air blower for blowing air into the top of a bag to separate the tops of the front and the back of said bag and partially open said bag,

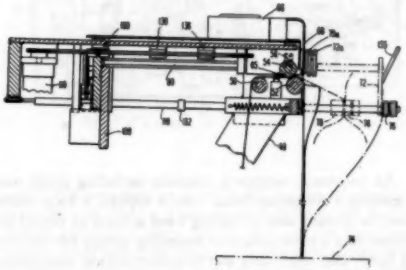
(b) a first pair of fingers movable downward into said bag and upward out from said bag and fixed relative to opposite directions transverse to said front and said back of said bag,

(c) a second pair of fingers movable downward into said bag and upward out from said bag and also movable in said transverse directions away from and toward said first pair of fingers,

(d) a pair of aligned heat-sealing members positioned to engage the outside surfaces of said tops of said front and said back of said bag and movable in said transverse directions toward and away from each other

(e) first drive means for moving said first pair of fingers and said second pair of fingers downward into said bag and upward out from said bag,

(f) second drive means for moving (1) said second pair of fingers in said transverse directions away from and toward said first pair of fingers and (2) said heat-sealing



members in said transverse directions toward and away from each other, and

(g) power supply means for energizing at least one of said heat-sealing members;

and control means for:

(a) actuating said bag feeding and positioning means to position a bag in said dispensing compartment to receive said articles from said article delivering means,

(b) actuating said air blower to separate the tops of the front and the back of said bag to partially open said bag,

(c) actuating said first drive means to move said first and said second pairs of fingers into said partially open bag,

(d) actuating said second drive means to move said second pair of fingers in a first of said transverse directions away from said first pair of fingers to spread said front and said back of said partially open bag to fully open said bag,

(e) actuating said article delivering means to fill said fully open bag with a prescribed amount of said articles,

(f) actuating said first drive means to move said first and said second pairs of fingers upward out from said filled bag,

(g) actuating said second drive means to move said heat-sealing members in said transverse directions toward each other to close said filled bag and clamp said tops of said front and said back of said filled bag between said heat-sealing members,

(h) applying power from said power supply means to said heat-sealing member to energize said heat-sealing member to seal said filled bag, and

(i) actuating said second drive means to move (1) said second pair of fingers in the second of said transverse directions toward said first pair of fingers and (2) said heat-sealing members in said transverse directions away from each other.

4,689,938

AUTOMATIC WRAPPING MACHINE COMPRISING A TENSIONING AND FASTENING DEVICE

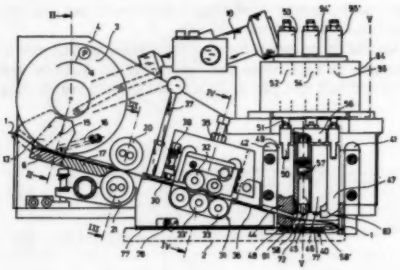
Dieter Zoppa, Balve, Fed. Rep. of Germany, assignor to PKM Verpackungssysteme GmbH & Co., Garbeck, Fed. Rep. of Germany

Filed Mar. 12, 1986, Ser. No. 839,174

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1985, 3504835; Mar. 13, 1985, 3508837

Int. Cl.[4] B65B *13/02*

U.S. Cl. 53—582 **8 Claims**



1. An automatic wrapping machine including guide means for guiding a wrapping band from a supply, a loop forming means for looping said wrapping band around an object to be wrapped and a tensioning and fastening device for the wrapping band, said tensioning and fastening device comprising:

a main frame member;

first driving means mounted to said main frame member for driving said wrapping band through the tensioning and fastening device;

tensioning means mounted to said main frame member for tensioning said wrapping band against the direction of driving;

first and second holding plungers slidably mounted to said frame member for holding first and second ends, respectively, of said wrapping band in an overlapping area of a wrapping loop formed by said loop forming means;

at least one electrode plunger slidably mounted to said frame member between said holding plungers for movement substantially perpendicular to said overlapping area;

second driving means for moving said holding plungers and said at least one electrode plunger toward and away from said overlapping area;

moveable plate means operatively coupled to and disposed below said at least one electrode plunger, said moveable plate means including an upper slide plate member and a lower slide plate member slidably coupled together and each including stops for limiting the sliding movement thereof relative to the other plate member;

a counter electrode element mounted to an end of said movable plate means; and

means for reciprocally moving said moveable plate means relative to said frame member in a plane parallel to said overlapping area of said wrapping loop.

4,689,939

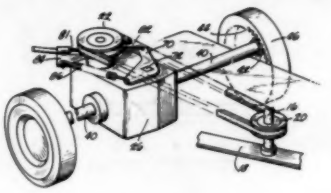
OPERATOR PRESENCE CONTROL FOR SELF-PROPELLED IMPLEMENTS

Carl E. Seyerle, Cordova, Tenn., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 746,938, Jun. 20, 1985, abandoned, which is a continuation of Ser. No. 697,681, Feb. 1, 1985, abandoned, which is a continuation of Ser. No. 490,960, May 2, 1983, abandoned. This application Jan. 9, 1986, Ser. No. 818,351

Int. Cl.[4] A01D *69/08, 34/67*

U.S. Cl. 56—11.1 **13 Claims**



1. A self-propelled lawn mower having a frame provided with a drive wheel and supporting an engine, a drive train for delivering power from the engine to the drive wheel and including clutch means comprising multiple drive and driven plates which are separated when the clutch means is disengaged, means biasing said plates to separated positions, and manual control means actuated by an operator for variably applying axial load to said plates against the action of said biasing means so as to variably engage said clutch means to effect rotation of said drive wheel at selective speeds within a speed range between zero and substantially above zero.

4,689,940

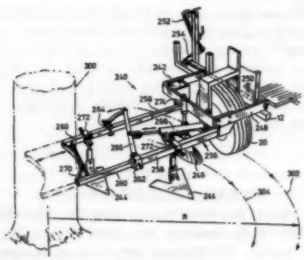
LAWN AND GARDEN MAINTENANCE APPARATUS

Jens B. Skovhoj, 128 Brahms Avenue, Willowdale, Ontario, Canada (M2H 1H8)

Division of Ser. No. 465,779, Feb. 11, 1983, Pat. No. 4,546,601. This application Jun. 11, 1985, Ser. No. 743,627

Int. Cl.[4] A01D *35/24;* A01B *73/00*

U.S. Cl. 56—228 **5 Claims**



1. An apparatus for use in lawn and garden maintenance comprising:

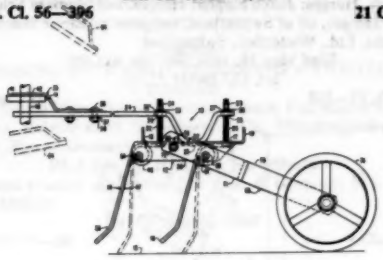
a chassis having a pair of axially aligned and independently operable drive wheels journally mounted thereon and having at least one idler wheel swivelly mounted thereon offset from the axis of the drive wheels; and

a cultivator comprising a frame mounted on the chassis and movable pivotably in a vertical plane containing the axis of the drive wheels, a plurality of hoes adjustably mounted on the frame, and means mounted on the chassis to raise and lower the frame pivotably into an inoperative and an operative position respectively.

4,689,941
PULLED DETHATCHING UNIT

Charles W. Doering, Louisville, Ky., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.

Continuation of Ser. No. 560,981, Dec. 13, 1983, abandoned. This application Aug. 30, 1985, Ser. No. 771,261
Int. Cl.[4] A01D *76/00*
U.S. Cl. 56—396 21 Claims



1. A pulled dethatching unit including:

frame means;

at least two wheels supported by said frame means adjacent the rear end of said frame means and on opposite sides of said frame means to continuously support said frame means, each of said wheels being independently rotatable;

means to separately adjust the position of each of said wheels relative to said frame means;

means supported by said frame means and extending forwardly therefrom for attachment to pulling means to enable pulling of said dethatching unit by the pulling means;

said frame means having at least one row of tines mounted thereon, each of said tines being mounted for movement independently of each of the other of said tines at all times, each of said tines extending downwardly from said frame means, all of said tines being forward of said wheels;

each of said tines having a lower portion extending forwardly of the vertical for engaging the material to be thatched during forward motion of said dethatching unit by said lower portion of each of said tines having its tip independently deflected downwardly and rearwardly as it comes in contact with grass so that said tip engages the material to be thatched to tear it loose from the soil and flip the material when said tip is released;

at least said lower portion of each of said tines being deflectable from its stationary longitudinal axis in any direction through 360°;

and said lower portion of each of said tines having its tip above the ground so that no weight is applied to any of said tines when said dethatching unit is at rest.

4,689,942
DEVICE AND METHOD FOR ASSEMBLING THREADS

Fernand Chateau, Pont-du-Chateau, France, assignor to Compagnie Generale des Establissements Michelin, Clermont-Ferrand, France

Filed Aug. 1, 1986, Ser. No. 892,694
Claims priority, application France, Aug. 7, 1985, 85 12192
Int. Cl.[4] D01H *7/88, 7/90;* D02G *3/28*
U.S. Cl. 57—58.36 14 Claims

1. A device for assembling at least two threads which comprises:

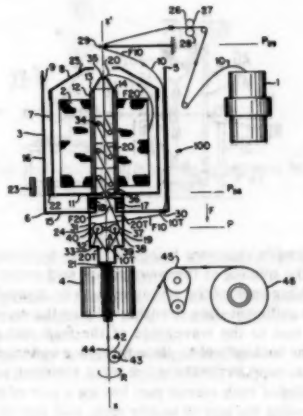
(a) a first group and a second group of bobbins, the first group being formed by at least one first bobbin on each of which is wound at least one first thread and the second group being formed by at least one second bobbin on each of which is wound at least one second thread;

(b) a wall and means for driving the wall in rotation around an axis;

(c) means for immobilizing the second bobbin during the rotation of the wall;

(d) first twisting means for twisting the first thread in the direction of rotation of the wall, the first twisting means being formed, at least in part, by a first upstream guide, a first downstream guide and the wall; the first twisting means permitting the first thread to come into contact with the inner face of the wall between said first guides and to turn jointly with the wall around the axis, turning around the second bobbin without making contact with the second bobbin;

(e) second twisting means for twisting the second thread in the direction of rotation of the wall, the second twisting means being formed, at least in part, by a second upstream guide and a second downstream guide; the direction in



which it is necessary to move along the axis of rotation in order to pass from a plane passing through the first upstream guide to a plane passing through the first downstream guide being the same as the direction in which it is necessary to move along said axis in order to pass from a plane passing through the second upstream guide to a plane passing through the second downstream guide, said planes being perpendicular to said axis;

(f) means other than the threads for driving the downstream guides in rotation around the axis of rotation of the wall in the same direction and at the same angular speed as the wall; and

(g) means for assembling the first thread with the second thread after the passage of these threads over the downstream guides by twisting these threads together in a direction opposite the direction of rotation of the wall.

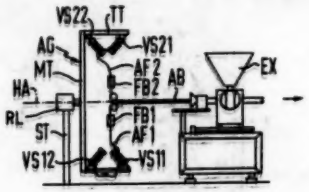
4,689,943
PAY-OUT STAND FOR SUPPLY REELS

Guenter Einsle, Munich; Ernst Mayr, Starnberg; Ulrich Oestreich, Munich; Gernot Schöeber, and Wolfgang Schrey, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 22, 1986, Ser. No. 821,251
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1985, 3503843
Int. Cl.[4] G02B *5/16;* G01H *13/04;* D07B *3/06*
U.S. Cl. 57—90 2 Claims

1. In a pay-out stand for supply reels for the manufacture of light waveguide bundles or cables, said pay-out stand having a structure, which is constructed for rotation and has means forming a back portion with a plurality of points lying in a circle concentric with a horizontal axis of rotation of the stand and a plurality of carrier parts with one carrier part for each

point on the circle, said carrier parts extending from said points of the circle and being substantially parallel to the horizontal axis, the improvement comprising each of said carrier parts having means for supporting two supply reels arranged in pairs for the light waveguide with a first supply reel of each pair being a feed reel capable of having its light waveguide being struck off overhead simultaneously with the waveguides of the feed reels of the other carrier parts and said waveguides being brought into a position required for forming the cable, a second reel of the pair being a backup reel, said pay-out stand forming a rotatable structure with its relevant feed and backup reels being also rotatable in an accessible position from the outside for an operator to splice the waveguide of the backup reel to the waveguide of the feed reel during the running operation of manufacture of the light waveguide bundles or cables without disturbing the pay-out of the waveguide from the feed reel,



said rotatable structure being in a non-displaceable position during the splicing of the waveguides, said means for supporting enabling each of the supply reels to be manually rotated to produce sufficient slack to enable splicing the waveguide of the backup reel to the waveguide of the feed reel and the then rotate the backup reel to place the splice under tension so that a separate support for the splice is not required, said means for supporting of each carrier part having a pair of retaining pins for receiving the pair of supply reels, said pair of pins extending obliquely relative to one another and being directed inwardly from the carrier part toward a common guide and braking device so that the longitudinal axis of each reel of the pair extends obliquely relative to each other and inwardly toward the common guide and braking device, and said carrier parts being constructed to enable accessibility from the outside of the pay-out stand.

4,689,944

FLAT YARN AND METHOD FOR PRODUCING THE SAME

Masahisa Toki; Seiji Satoh, both of Osaka; Yoshiaki Matsui; Kunio Morihata, both of Nagoya, and Toyoji Murata, Kiryu, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Division of Ser. No. 779,114, Sep. 23, 1985, Pat. No. 4,633,662. This application Aug. 26, 1986, Ser. No. 900,412
Claims priority, application Japan, Sep. 28, 1984, 59-203299
Int. Cl.[4] D02G *1/00, 1/14, 7/00*
U.S. Cl. 57—260 **4 Claims**

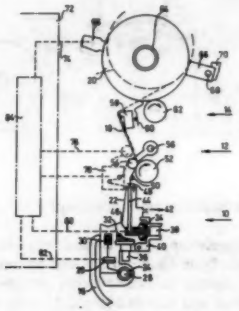
1. A flat yarn wherein fibers composing a yarn are bonded to each other substantially in a side-by-side manner to form a tape-like flat body and said flat body had a plurality of gear-crimped portions across a width thereof, wherein said gear-crimped portions are arranged randomly in the lengthwise direction of said yarn.

4,689,945

OPEN-END YARN PIECER

Andre Lattion, Seuzach; Jürg Bischofberger, Elsau; Walter Salvik, Horgen; Jakob Stapfer, Horgen, and Manfred Schreiber, Horgen, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 18, 1984, Ser. No. 611,602
Int. Cl.[4] D01H *15/02*
U.S. Cl. 57—263 **23 Claims**



1. A method of automatically piecing a spinning station of a rotor spinning machine having a plurality of said stations, each station including a rotor spinning unit having a yarn withdrawal tube, a package forming means, a nip roll pair for withdrawing yarn from the withdrawal tube for delivery to the package forming means, feed means for feeding fiber to the spinning unit and drive means for driving the rotor spinning unit at a predetermined operating speed, package forming means, nip roll pair and feed means; said method comprising the steps of

separating the nip roll pair;

inserting a seed yarn during a preliminary stage to a position within an upstream end of the withdrawal tube;

forming a ring of fibers in the rotor spinning unit after said preliminary stage;

back-feeding the seed yarn during a final stage from said position to join with the ring of fibers to form a pieced yarn;

re-engaging the nip roll pair to commence withdrawing of the pieced yarn from the withdrawal tube; and

running the rotor spinning unit at said operating speed while effecting said final stage of back-feeding and the withdrawal of the pieced yarn.

13. A travelling piecer for a spinning machine having a plurality of spinning stations, each station including a rotor spinning unit having a yarn withdrawal tube, a package forming means, a nip roll pair for withdrawing yarn from the withdrawal tube for delivery to the package forming means, feed means for feeding fiber to the spinning unit, and drive means for driving the rotor spinning unit at a predetermined operating speed, package forming means, nip roll pair and feed means, said piecer comprising

means for selectively separating the nip rolls of a selected spinning station;

means for inserting a seed yarn between the separated nip rolls;

means for operating the feed means of a selected spinning station to form a ring of fibers in the spinning station;

a device for back-feeding the seed yarn to the spinning unit, said device being operable in a preliminary stage to permit suction within the spinning unit to draw the seed yarn along the withdrawal tube until the end of the seed yarn is

at a predetermined position and operable in a final stage to permit movement of the end of the seed yarn from said predetermined position to join with the ring of fibers in the rotor, and

means for re-engaging the separated nip rolls to commence withdrawal of the pieced yarn from the withdrawal tube at the expiration of said final stage.

4,689,946

SPINNING DEVICE FOR PRODUCING A TWISTED THREAD

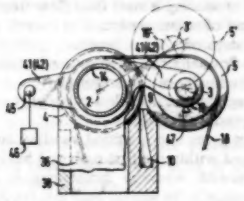
Heinz-Georg Wassenhoven, Möchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Feb. 21, 1986, Ser. No. 832,046

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506254

Int. Cl.⁴ D01H *7/885*

U.S. Cl. 57—301 **4 Claims**



1. Spinning device for producing a twisted thread of spinning fibers, the device having two friction elements rotatable in the same rotary direction and with mutually parallel rotational axes, and a position varying device for permitting the friction elements to be brought temporarily into another position relative to one another for cleaning purposes, comprising constructive means in the position varying device for assuring constant parallelism of the rotational axes, at least one of the two friction elements being rotatably mounted in swivel arms, said swivel arms being pivotable, in turn, about the rotational axis of the other friction element.

4,689,947

APPARATUS AND METHOD FOR REDUCING BROKEN FIBERS ON THE SURFACE OF A CARBON FIBER YARN BUNDLE

Steven J. Winckler, Troy, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

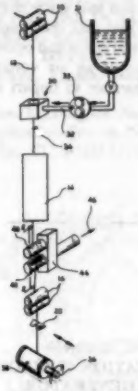
Filed Aug. 19, 1986, Ser. No. 898,903

Int. Cl.⁴ D02J *3/12, 3/14, 7/00*; D01H *13/30*

U.S. Cl. 57—304 **5 Claims**

1. In an apparatus for removing broken fibers from a multifilament carbon yarn moving in a path that includes a suction nozzle coupled to a source of suction, said nozzle being located adjacent said path, the improvement comprising: said nozzle having a slot-shaped intake passage substantially perpendicular to said path and in communication with said source of suction, said slot-shaped intake passage being formed of a continuous wall and having leading and trailing edges, said trailing edge being a sharp edge vertically displaced from said leading edge to form an extended wall of said passage; and means for guiding said yarn close to said trailing edge.

4. A method for reducing broken fibers on a portion of the surface of a carbon fiber yarn having a coating thereon comprising: forwarding the carbon yarn in a path past a nozzle having a slot shaped intake passage with a leading edge and a sharp trailing edge vertically displaced from said leading edge, said path being substantially perpendicular to said nozzle; applying a sufficient suction to said nozzle to draw the ends of the broken fibers toward said nozzle; and impacting said broken fibers against said sharp trailing edge to cut said broken fibers from said yarn.



4,689,948

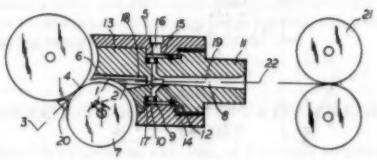
VORTEX AIR NOZZLE FOR YARN SPINNING FROM STAPLE FIBERS

Dinko A. Bahov, Gabrovo, and Hristo A. Bahov, Stara Zagora, both of Bulgaria, assignors to NPK "Textilno Maschinostroene", Gabrovo, Bulgaria

Filed May 9, 1986, Ser. No. 861,496

Int. Cl.⁴ D01H *5/28, 7/92*; D02G *1/04*

U.S. Cl. 57—328 **3 Claims**



1. A false-twist-producing air vortex spinning nozzle, comprising:

a pair of drafting rollers including an upper roller and a lower roller having respective axes lying in a common plane inclined to a linear spinning path extending along an axis and between which a roving of staple fibers is fed;

an inlet body formed with an elongated inlet chamber extending along said axis having an inlet end receiving said roving from said rollers, said lower roller projecting into said chamber from below, opposite sides of said chamber along said path being formed with generally flat grooves receiving said roving and in which free fiber ends are formed and guided, said inlet body being formed at an outlet end opposite said inlet end with a projecting tip;

an outlet body axially adjoining at one end thereof said inlet body and formed with an elongated outlet chamber axially aligned with said tip and receiving said roving therefrom, said outlet chamber opening into an outlet diverging toward an end of said outlet body opposite said end at which said outlet body adjoins said inlet body, said bodies defining between them an annular outwardly open space surrounding said tip and opening into said outlet chamber around said tip;

a sleeve at least partly receiving said bodies and defining an

annular compartment connectable with a compressed-air source; and

means including a step formed on said outlet body between said compartment and said space defining passages angularly spaced about said axis, communicating between said compartment and said space and opening tangentially into said space to generate an air vortex where said space opens into said chamber to impart a false twist to said roving.

4,689,949

COAL GASIFICATION COMPOSITE POWER GENERATOR

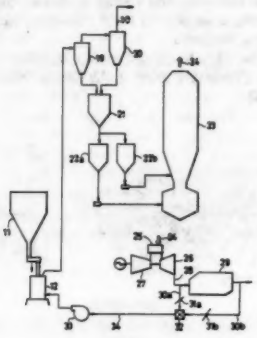
Masamichi Kashiwazaki; Kiichiro Ogawa, and Satoshi Uchida, all of Tokyo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1986, Ser. No. 816,389

Claims priority, application Japan, Jan. 30, 1985, 60-14340

Int. Cl.[4] C10J *3/48, 3/50, 3/86;* **F02B** *43/08*

U.S. Cl. 60—39.12 **4 Claims**



1. In a coal gasification composite power generator which comprises a coal pulverizer in which coal is finely pulverized, a means for transferring the finely pulverized coal with a drying gas, a coal feeding means for feeding the coal from the transfer means to a gasification furnace in which the coal is converted to a combustible gas, a gas turbine connected to the gasification furnace and driven by combustion of the combustible gas fed from the gasification furnace, and an exhaust gas boiler to which an exhaust gas from the gas turbine is passed to recover the heat of the exhaust gas, the improvement characterized by further comprising gas mixing means, means connecting said gas turbine to said exhaust gas boiler, first means for withdrawing part of the combustion exhaust gas from said gas turbine from said connecting means upstream from the exhaust gas boiler and introducing the withdrawn part of the combustion exhaust exhaust gas into said gas mixing means, outlet means for flowing combustion exhaust gases frm said exhaust gas boiler, second means for withdrawing combustion exhaust gases from said outlet means and introducing the withdrawn part into said gas mixing means, and a pipe connecting said gas mixing means to said pulverizer, so that the mixed gas is passed to the pulverizer for use as the drying gas.

4,689,950

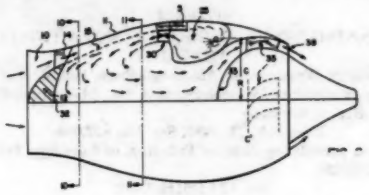
HOT GAS FLOW GENERATOR WITH NO MOVING PARTS

John E. Minardi, and Hans P. von Ohain, both of Dayton, Ohio, assignors to University of Dayton, Dayton, Ohio

Filed Jun. 17, 1985, Ser. No. 745,166

Int. Cl.[4] F02K *7/00*

U.S. Cl. 60—204 **6 Claims**



1. A method of producing a mass fluid flow from an engine housing without use of rotating parts,

comprising the steps of:

causing an inlet flow of air to swirl into a first circular path moving longitudinally of the housing,

adding heat energy to said inlet flow of air at the end of said first path to produce hot gases,

directing the hot gases into a second swirling circular path coaxially of and within the first path and having an open interface therewith whereby momentum is transferred from the hot gases in the second path into the inlet flow of air in the first path, and

converting the swirling hot gases at the end of the second path into an essentially unidirectional gas flow exiting the housing.

4,689,951

DEVICE FOR REMOVING SOLID PARTICLES, PARTICULARLY SOOT, FROM EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE

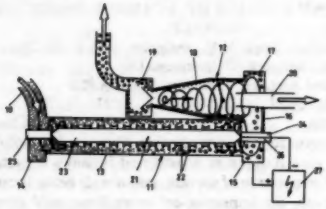
Wilhelm Polach, Möglingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 23, 1985, Ser. No. 813,225

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1985, 3500375

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—275 **4 Claims**



1. A device for removing solid particles, particularly soot from exhaust gas of an internal combustion engine, comprising an electric filter including a source of direct current high voltage, a tubular filter housing electrically connected to the positive pole of the voltage source, a central electrode in the form of a cylindrical shell arranged coaxially in the filter housing and being electrically connected to the negative pole of the voltage source, the cylindrical shell having a plurality of cut-out portions delimiting segments provided with electrical discharge points, said segments being bent radially outwardly toward the inner wall of said filter housing; and the wall thickness of the cylindrical shell being about 0.05 mm so that the

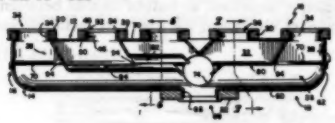
entire central electrode is brought into vibrations during the running of the engine.

4,689,952

TUNED EXHAUST MANIFOLD

James C. Arthur, and Freddie A. Baldwin, both of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Filed Jun. 13, 1986, Ser. No. 873,984
Int. Cl.[4] F02B 27/02; F01N 7/10
U.S. Cl. 60—313 27 Claims



1. An exhaust manifold for attachment to an engine having a plurality of exhaust ports, the exhaust manifold comprising

a housing formed to include an exhaust chamber, inlet means for admitting combustion product discharged from the engine exhaust ports into the exhaust chamber, and outlet means for exhausting combustion product from the exhaust chamber, the housing including an inner shell providing the inlet means and an outer shell attached to the inner shell at a perimetrically extending split line, the inner and outer shell cooperating to define the exhaust chamber therebetween, and

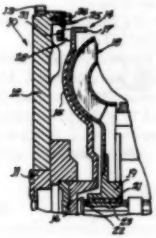
baffle means rigidly fixed in the exhaust chamber for partitioning the exhaust chamber to define separate passageways connecting each of the engine exhaust ports to the outlet means so that the flow of combustion product discharged from each engine exhaust port and admitted into the exhaust chamber is substantially isolated in its companion passageway as it is conducted through the housing to permit performance tuning of the exhaust manifold, the baffle means including at least one baffle rigidly attached to the housing at the split line.

4,689,953

VARIABLE RATE DRIVE STRAP

Ting M. Wang, Warren, Mich., assignor to Borg-Warner Automotive, Inc., Troy, Mich.

Filed Aug. 14, 1986, Ser. No. 896,375
Int. Cl.[4] F16F 1/18; F16D 3/52
U.S. Cl. 60—330 7 Claims



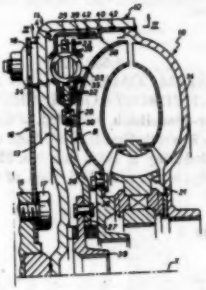
1. A drive strap assembly adapted for utilization between an engine flywheel and a torque converter housing, comprising an elongated relatively flexible drive strap secured at its opposite ends to the flywheel and the torque converter cover, and a pair of relatively stiff back-stops sandwiching one end of said drive strap, the back-stops having free ends being oppositely outwardly curved away from the drive strap.

4,689,954

TRANSMISSION SYSTEM, IN PARTICULAR FOR AUTOMOBILE VEHICLES, HYDRAULIC COUPLING UNIT COMPRISING SAME, MOVEMENT TAKE-UP DEVICE ADAPTED FOR USE IN SAME, AND METHOD OF MANUFACTURING SAID MOVEMENT TAKE-UP DEVICE

René Billet, Lamorlaye, France, assignor to Valeo, Paris, France

Filed Nov. 7, 1985, Ser. No. 795,886
Claims priority, application France, Nov. 9, 1984, 84 17126
Int. Cl.[4] F16D 33/00
U.S. Cl. 60—338 17 Claims



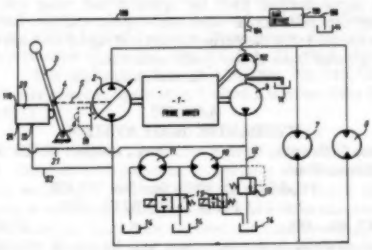
1. Transmission system comprising an annular input member adapted to be keyed at least circumferentially to a first shaft and having a generally cylindrical axial wall and a movement take-up device within said cylindrical wall having at least one mild steel lug protected against subsequent hardening treatment, said lug keying siad movement take-up device axially and circumferentially to said cylindrical wall, said movement take-up device adapted to be at least circumferentially keyed to a second shaft, said movement take-up device having an input part to which one end of said lug is welded, the other end of said lug being fixed to said cylindrical wall.

4,689,955

VIBRATION ROLLER HAVING A POWER LIMITING DEVICE

Heinz Lietzke, Neuss, Fed. Rep. of Germany, assignor to Case Vibromax GmbH & Co KG, Fed. Rep. of Germany

Filed Jun. 5, 1984, Ser. No. 617,619
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321443
Int. Cl.[4] F16D 31/02
U.S. Cl. 60—420 22 Claims



1. A vibration roller apparatus comprising:

a prime mover;

a hydraulic pump driven by said prime mover;

a hydraulic travelling drive means for providing travelling

operation of said vibration roller, apparatus said travelling drive means being hydraulically connected to said pump;

at least one hydraulic vibration drive means for operating a vibration device of said vibration roller, apparatus said vibration drive means only being adapted to be hydraulically powered by said prime mover;

at least one travelling lever for controlling said travelling drive means, said lever being movable within a setting range; and

an automatic power limiting means for engaging said travelling lever and for limiting said setting range of said lever to thereby limit a total power output taken from said prime mover to a value no greater than a limiting power of said prime mover thus preventing an overloading of said prime mover.

4,689,956

DRIVE SYSTEM COMPRISING AN ADJUSTABLE HYDROSTATIC MACHINE

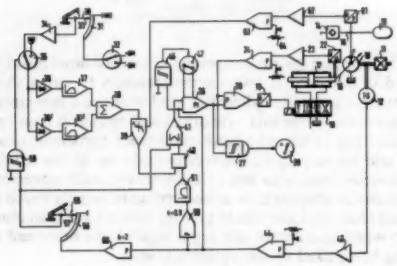
Theo Hein, Lohr-Sendelbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed May 1, 1986, Ser. No. 858,198

Claims priority, application Fed. Rep. of Germany, May 11, 1985, 3517104

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—449 **12 Claims**



1. Drive system comprising an adjustable hydrostatic machine which is connected to a pressure line and operating as motor or pump takes fluid from the pressure line or supplies fluid to said pressure line, having a directional valve for actuating the adjusting member of the hydrostatic machine for setting a rotational speed, comprising a rotational speed controller to which the speed actual value is supplied by a tachogenerator coupled to the machine and an arbitrarily settable speed desired value is supplied and which generates a control signal for driving the directional valve, characterized in that the desired value input of the speed controller (**26**) is preceded by a selection stage (**40**) to which the speed desired value and a guide signal derived from the speed actual value and lying beneath the speed actual value are supplied and that the selection stage switches the particular greater signal through to the desired value input of the speed controller.

4,689,957

HYDRAULIC TOOL SYSTEM

William Gallentine, Hood River, Oreg., assignor to Galco, Inc., Bellevue, Wash.

Filed Sep. 23, 1985, Ser. No. 779,178

Int. Cl.[4] F16D *31/02*; B25B *7/00*

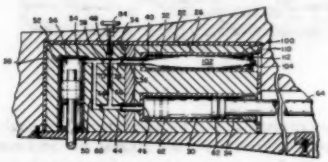
U.S. Cl. 60—481 **27 Claims**

1. A modular hydraulic power unit for use in various tool bodies, comprising:

a removable, modular fluid reservoir having a fluid outlet and means for maintaining a volume of hydraulic fluid under pressure;

a fluid pump having a fluid containing cylinder with a fluid outlet at one end and fluid displacing piston mounted for reciprocal motion within the cylinder wherein depression of the piston towards the fluid outlet end displaces fluid from the cylinder;

a removable, modular valve body having a fluid input port, a fluid output port, an input conduit between the input port and the pump cylinder outlet on the fluid pump including means within the input conduit for permitting fluid flow from the fluid reservoir to the pump cylinder when the pump piston is retracted and for preventing fluid return to the reservoir through the input conduit when the pump piston is depressed, an output conduit between the pump cylinder outlet and the exit port including means



within the output conduit for allowing fluid displaced from the pump cylinder to exit the valve body through the output port and for preventing fluid return to the pump cylinder through the output conduit, and a bypass conduit between the exit port and the input port including selectively operable bypass means for returning fluid from the exit port to the fluid reservoir through the bypass conduit;

detachable couplings connecting the fluid reservoir outlet to the valve body input port allowing fluid flow therebetween; and

a frame having a valve body receptacle and a fluid reservoir receptacle including means for releasably securing the valve body and fluid reservoir within the receptacles.

4,689,958

BRAKE BOOSTER

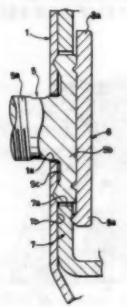
Masao Arino, Higashimatsuyama, and Michio Kobayashi, Kawajima, both of Japan, assignors to Jidosha Kiki Co., Ltd., Shibuya, Japan

Filed Aug. 19, 1986, Ser. No. 898,177

Claims priority, application Japan, Sep. 30, 1985, 60-149499

Int. Cl.[4] B60T *13/40*

U.S. Cl. 60—547.1 **7 Claims**



1. A brake booster including an enclosed shell which has its interior divided into a plurality of pressure chambers, a master cylinder fastened to the enclosed shell by mounting bolts which extends through the front end face of the shell, and strengthening plate disposed against the internal surface of the shell around each of the mounting bolts; characterized in that the strengthening plate is welded to the internal surface of the

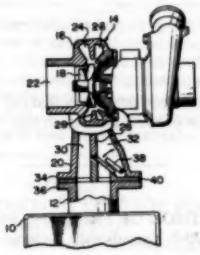
shell while the head of the mounting bolt is welded to the internal surface of the shell so as to maintain a hermetic seal therebetween, and a reinforcing member fixedly connected to the strengthening plate is disposed on top of the head of the mounting bolt and welded thereto.

4,689,959

VARIABLE-CAPACITY TURBOCHARGER

Atsushi Houkita, Katsuta, and Tomio Hokari, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 2, 1986, Ser. No. 881,402
Claims priority, application Japan, Jul. 3, 1985, 144785/85
Int. Cl.[4] F02B *37/12*
U.S. Cl. 60—602 **7 Claims**



1. A variable-capacity turbocharger comprising:
(a) a turbine casing having a turbine inlet portion, a turbine outlet portion and a scroll chamber;
(b) a turbine impeller located in said scroll chamber and having a multiplicity of blades;
(c) a partition wall extending to the vicinity of said turbine inlet portion to partition said scroll chamber into a first scroll chamber and a second scroll chamber and to define a first exhaust introducing passageway and a second exhaust introducing passageway for introducing exhaust gases separately into said first scroll chamber and second scroll chamber respectively;
(d) exhaust flow control valve means located at least in said second exhaust introducing passageway and opening in the direction of flow of the exhaust gases; and
(e) valve seat means formed separately from the turbine casing and located in the turbine inlet portion, said valve seat means cooperating with said exhaust flow control valve means to control the flowrate of exhaust gases flowing into said second exhaust introducing passageway.

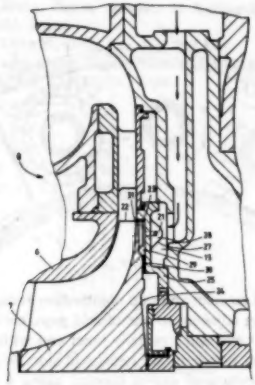
4,689,960

TURBO SUPERCHARGER FOR AN INTERNAL COMBUSTION ENGINE

Joachim Schröder; Hanns-Günter Bozung, both of Neusäss; Rudolf Bandel, Augsburg, and Hans Mendle, Friedberg, all of Fed. Rep. of Germany, assignors to M.A.N. - B&W Diesel GmbH, Augsburg, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,560
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1985, 3504465
Int. Cl.[4] F02B *33/44*
U.S. Cl. 60—607 **22 Claims**

1. The combination of an internal combustion engine (ICE) with
an exhaust gas turbosupercharger
wherein the exhaust gas turbosupercharger includes
a common shaft (2);
an exhaust gas turbine (4) secured to the common shaft and pneumatically coupled to receive exhaust gases from the internal combustion engine;
a compressor housing (20);
a compressor wheel (7) secured to the common shaft and operable in the compressor housing, and providing compressed charging air to the internal combustion engine,
the compressor wheel having compression vanes or blades (22);
means for introducing auxiliary compressed air to the compressor wheel having
a source (12, 13) of compressed air,
means defining a compressed air chamber (15),
a controllable connection (41) between the source of compressed air and the compressed air chamber (15), and
nozzle means (21) pneumatically connecting the compressed air chamber (15) and the compressor wheel housing, and directing compressed air along a nozzle axis from the nozzle means against the compressor wheel to provide additional drive energy to the compressor wheel when the controllable connection is controlled to supply compressed air from the source (12, 13) to the chamber (15),
and comprising, in accordance with the invention,
a set of auxiliary drive vanes or blades (23) secured to the compressor wheel (7), the auxiliary drive vanes or blades of the set being uniformly distributed about the compressor wheel (7);
and wherein the axes of the nozzle means are positioned to direct the compressed air against the auxiliary drive blades or vanes (23) at an impingement angle providing at least approximately optimum energy transfer from the compressed air emitted through the nozzle means to the auxiliary drive vanes or blades.



4,689,961

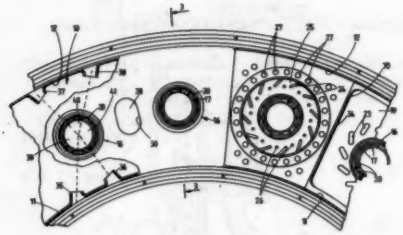
COMBUSTION EQUIPMENT

John F. Stratton, Accrington, England, assignor to Lucas Industries public limited company, Birmingham, England

Continuation of Ser. No. 704,281, Feb. 22, 1985, abandoned. This application Sep. 23, 1986, Ser. No. 910,783
Claims priority, application United Kingdom, Feb. 29, 1984, 8405271
Int. Cl.[4] F02C *1/00*; B05B *7/10*
U.S. Cl. 60—748 **6 Claims**

1. Combustion equipment comprising a flame tube having walls defining a combustion zone therein, flame tube wall means in which is defined an air inlet to be at one end of said flame tube; an outer flare segment mounted in said flame tube adjacent said inlet, said outer flare segment having a passage through said outer flare segment communicating with said air inlet and with said combustion zone; a fuel injector disposed in said passage and having a fuel outlet discharging into said combustion zone; an air swirler device disposed in said passage and surrounding said fuel injector, said air swirler device in-

cluding a plurality of spaced blades which are shaped and positioned to cause air flowing from said air inlet and passing through said passage and between said blades and into said combustion zone to move in a swirling motion about the flow direction axis, adjacent edges of adjacent blades defining gaps through which said air flows; an inner flare mounted on said air swirler device, said inner flare having a downstream portion which expands radially outwardly of said passage to direct a first amount of the flowing air against an inner surface of said outer flare segment and a second amount of the flowing air along a path spaced from the inner surface of said outer flare segment; a plurality of elongate slots defined in said outer flare segment to be located peripherally outside of said inner flare, said slots being positioned to form an annulus which is concentric with said passage and providing further communication



between said air inlet and said combustion zone, each said slot being locating adjacent to one of said gaps, each slot having a radially outer end and a radially inner end with a longitudinal axis extending between said ends, said slots being oriented so that said longitudinal axis is located along a secant of said annulus and is inclined so that the direction of extent of said slot longitudinal axis from said outer slot end to said inner slot end is opposite to the direction of said air swirling motion, means for providing air to said slots so that air passing through said slots flows in a direction different from said swirling direction and flows on a path which surrounds said swirling air to constrain and confine flow of fuel from said fuel injector and swirling air from said air swirler device and prevent such fuel and swirling air from moving radially outward beyond said annulus.

4,689,962

PROCESS AND APPARATUS FOR HANDLING A VAPORIZED GASEOUS STREAM OF A CRYOGENIC LIQUID

Antony Lofredo, Springfield, N.J., assignor to The Boc Group, Inc., Montvale, N.J.

Filed Jan. 17, 1986, Ser. No. 819,560
Int. Cl.[4] F17C *13/00*
U.S. Cl. 62—54 **8 Claims**

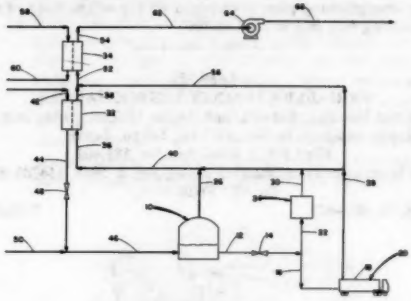
1. A process for gas treating comprising the steps of:

(a) recovering boil-off vapors generated in the storage and/or handling of a cryogenic liquid;

(b) passing said boil-off vapors in indirect heat transfer relationship with a compressed gaseous stream to be expanded to form said cryogenic liquid to thereby cool said compressed gaseous stream and thereby heat said boil-off vapors;

(c) expanding said thus cooled compressed gaseous stream of step (b) to form cryogenic liquid;

(d) compressing said thus heated boil-off vapors of step (b); and



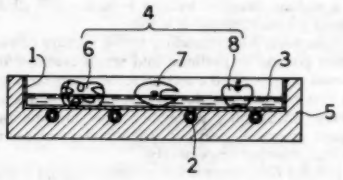
(e) admixing said compressed boiled-off vapors of step (d) with said compressed gaseous stream of step (b) prior to step (c).

4,689,963

METHOD OF FREEZING FOODS

Tadaaki Sakai, 39-8 Yamadanishi 3-chome, Suita-shi, Osaka, Japan

Filed Jul. 2, 1986, Ser. No. 881,388
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—64 **7 Claims**



1. A method of freezing food articles which comprises the step of cooling heat transfer means having an open end, and the step of bringing the food articles to be frozen in contact with one surface of the heat tranfer means through a layer of brine present therebetween and keeping the food articles in said contact relation, whereby the food articles may begin to be frozen only with their respective portions at which they are in contact with the brine.

4,689,964

ZERO GRAVITY (POSITION-INSENSITIVE) LOW-TEMPERATURE MULTI-COMPONENT REFRIGERATOR

Michael St. Pierre, Rohnert Park, Calif., assignor to Marin-Tek, Inc., San Rafael, Calif.

Filed Apr. 2, 1986, Ser. No. 847,232
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—114 **16 Claims**

1. A refrigeration system which comprises:

(a) a plurality of cascaded heat exchangers, each heat exchanger including a high pressure line and a suction region, said high pressure lines being connected in cascade by a connection region;

(b) a constriction in each said connection region between said heat exchangers; and

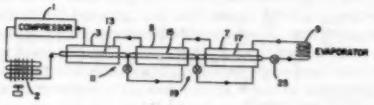
(c) a capillary tube having an opening disposed at and facing

upstream of each said constriction and terminating in a suction region of a said heat exchanger.

9. A refrigeration method which comprises:

(a) providing a plurality of cascaded heat exchangers, each heat exchanger including a high pressure line and a suction region, said high pressure lines being connected in cascade by a connection region,

(b) providing a constriction in each said connection region between said heat exchangers;



(c) providing a capillary tube having an opening disposed at and facing upstream of each said constriction and terminating in a suction region of a said heat exchanger; and

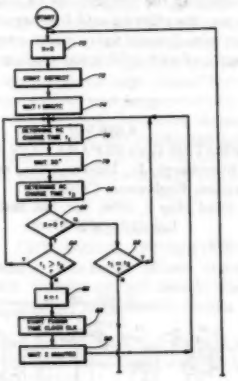
(d) applying a multi-component refrigerant to said constriction having a liquid phase and a gaseous phase in sufficient volume to substantially seal said gaseous refrigerant from said constriction with said liquid regrigerant.

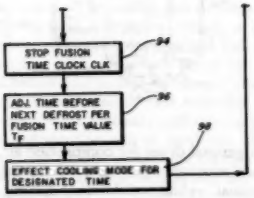
4,689,965

ADAPTIVE DEFROST CONTROL FOR A REFRIGERATOR

Donald E. Janke, Benton Township, Berrien County, and William J. Linstromberg, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 27, 1985, Ser. No. 814,216
Int. Cl.[4] F25D *21/06*
U.S. Cl. 62—155 **15 Claims**




STOP FUSION TIME CLOCK CLK
94
ADJ. TIME BEFORE NEXT DEFROST PER FUSION TIME VALUE T_F
96
98
EFFECT COOLING MODE FOR DESIGNATED TIME

1. A control for a refrigeration device having cooling apparatus including an evaporator, defrosting apparatus for removing frost from the evaporator and means for energizing the defrosting apparatus at the end of a cooling cycle to initiate a defrost cycle, comprising:

detecting means for detecting the rate of change of evaporator temperature during a defrosting cycle;

determining means for determining the length of time the rate of change of evaporator temperature remains at substantially zero; and

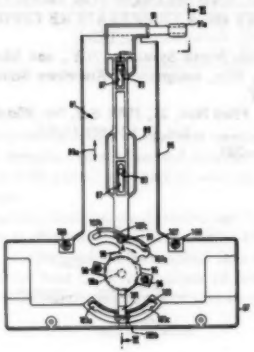
establishing means for establishing the duration of a subsequent cooling cycle in dependence upon the determined length of time.

4,689,966

REFRIGERATION HAVING MODE-CHANGE CHAMBER CAPABLE OF OPERATION WITHIN FREEZING, CHILL AND REFRIGERATION TEMPERATURE RANGES

Hikaru Nonaka, Osaka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 29, 1985, Ser. No. 792,585
Claims priority, application Japan, Nov. 15, 1984, 59-241232
Int. Cl.[4] F25D *17/04*
U.S. Cl. 62—187 **3 Claims**



1. A refrigerator including a mode-change chamber capable of being operated within first and second temperature ranges and comprising:

cooling means for providing a source of cooling air;

first and second duct means for establishing communication between said mode-change chamber and said cooling means;

first and second damper means operatively coupled to said first and second duct means to selectively permit said cooled air to flow into said mode-change chamber from said cooling means; and

control means for selectively operating either said first damper means or said second damper means to thereby establish said first and second temperature ranges within said mode-change chamber and including:

(a) an operating rod mounted for reciprocal rectilinear movements between an operative position wherein one end of said rod engages said first damper means to cause said first damper means to open and an inoperative position wherein said rod permits said first damper means to close;

(b) a cam follower formed on another end of said rod;

(c) a handle member which is pivotally manually movable between at least first and second positions corresponding to said operative and inoperative positions of said rod; and

(d) cam means operatively coupled between said handle member and said cam follower and establishing a cam track having a first arcuate portion a second arcuate portion of a lesser radius than said first arcuate portion

and a transition portion connecting said first and second arcuate portions, said cam means for translating said pivotal movements of said handle member between said first and second positions into reciprocal movements of said rod between said operative and inoperative positions, respectively, wherein said cam means causes said cam follower to follow said first arcuate portion responsive to said handle member being moved into said first portion thereby displacing said rod into said operative position thereby opening said first damper means, and wherein said cam means causes said cam follower to follow said second arcuate portion responsive to said handle member being moved into said second position thereby displacing said rod into said inoperative position whereby said first damper means can be selectively manually opened and closed.

4,689,967

CONTROL AND METHOD FOR MODULATING THE CAPACITY OF A TEMPERATURE CONDITIONING SYSTEM

Doyoung Han, North Syracuse, N.Y., and Merle A. Renaud, Onalaska, Wis., assignors to American Standard Inc., New York, N.Y.

Filed Nov. 21, 1985, Ser. No. 800,426
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—201 **18 Claims**

1. In a system for temperature conditioning a fluid to a predetermined setpoint temperature, a system capacity control comprising

a. a temperature sensor responsive to the temperature of the conditioned fluid;

b. means for selecting a first variable used for determining the widths of a first deadband and a second relatively wider deadband, said deadbands being related to control of system capacity in response to deviation of the fluid temperature from the setpoint temperature;

c. means for selecting a second variable defining a gain setting for the control; and

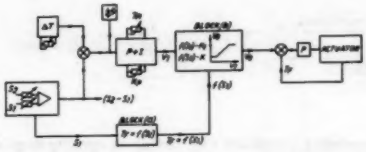
d. control means, connected to the temperature sensor, and the first and the second variable selecting means and responsive to the conditioned fluid temperature, the first variable, and the gain setting, said control means being operative to determine the width of the first and second deadbands as a function of the first variable, and to determine the deviation of the fluid temperature from the setpoint, and further operative to modulate the capacity of the system to maintain the temperature of the conditioned fluid near the setpoint as a function of the gain setting, using the first deadband if the absolute value of the deviation of the fluid temperature from the setpoint is increasing and using the wider second deadband if the absolute value of said deviation is decreasing.

4,689,968

ACTUATOR MEANS FOR THE CONTROL OF A REFRIGERATION SYSTEM EXPANSION VALVE

Robert M. McCulloch, Broager, and Ove Jorgensen, Sonderborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Mar. 21, 1986, Ser. No. 842,539
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—225 **5 Claims**



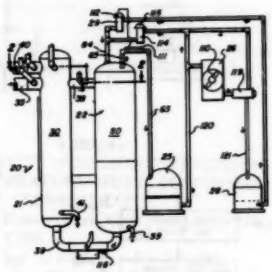
1. A regulating system for a refrigeration installation of the type having a compressor, condenser and an evaporator arranged in series and first and second electrical temperature sensors at the inlet and outlet ends of the evaporator, the first sensor being positioned to respond to the temperature of a liquid refrigerant expanded to suction pressure and the second sensor being positioned to respond to suction line sensible temperature, said regulating system, comprising, thermostatic valve means for controlling the flow of refrigerant to said evaporator having an actuator chamber filled with a refrigerant medium having liquid and vapor phases, an electrical heat supply element in said actuator chamber, an electrical feedback in said actuator chamber, control means connected to said sensors and said elements for generating a superheat error signal for controlling the temperature of said refrigerant medium, and means for utilizing said first sensor to determine a reference start value for said valve means corresponding to the opening pressure of said refrigerant medium in said actuator chamber.

4,689,969

REFRIGERATED GAS SEPARATION APPARATUS

Leon R. Van Steenburgh, Jr., Denver, Colo., assignor to Wilkerson Corporation, Englewood, Colo.

Filed May 6, 1986, Ser. No. 860,135
Int. Cl.[4] F25B *43/00*
U.S. Cl. 62—474 **8 Claims**



1. In a refrigerated dryer for compressed air, a refrigeration evaporator and moisture separation unit comprising, in combination, a vertical, cylindrical housing having in longitudinal alignment an air cooler section and a moisture separator section, means at one end of said housing defining an air inlet chamber, means at the other end of said housing defining a moisture sump, an outlet drain for draining said sump, a refrigeration evaporator heat exchanger in said air cooler section,

said heat exchanger comprising a finned tube refrigeration system evaporator, said evaporator having adjacent inlet and outlet conduits for connection with a refrigeration system, a plurality of baffle plates inserted between said fins at spaced intervals alternating on opposite sides of said finned tube assembly for channeling air transversly across said finned tube evaporator, a generally hexagonal housing enclosing said evaporator and inserted baffles to provide an internal cooling chamber, said hexagonal housing having generally circular end panels for mounting said hexagonal housing within said outer cylindrical housing, said end panels having openings for the passage of compressed air therethrough, said hexagonal housing being formed in two sections, each having three angularly disposed wall panels and opposed longitudinal seam panels on the outer edges of the wall panels, a pair of longitudinal spacer strips for holding said baffles in spaced relation, a spacer strip and a pair of juxtaposed seam panels being secured together to form the side seams of the hexagonal housing when said wall panel sections are mounted together in evaporator enclosing arrangement, an air flow directing outlet nozzle on the outlet end panel of said hexagonal housing, said nozzle being eccentrically positioned to provide a generally tangential air outlet flow pattern from said evaporator cooling section into said moisture separator section, a downwardly opening conical baffle extending axially centrally within said moisture separator section and extending axially from said cooler section to a point adjacent said sump, the larger end of said baffle opening above said sump, an air outlet conduit extending from the lower end of said cylindrical housing upwardly into said conical baffle, said baffle and conduit being positioned to prevent the passage of liquid into said outlet conduit, a plurality of longitudinally extending scraper bars secured to the internal surface of said cylindrical housing within said moisture separator section, said scraper bars having a hooked edge extending radially inwardly of said cylindrical housing with the hook extending towards the direction of air flow for interrupting said air flow and creating turbulence to effect the removal from said air of moisture condensed therein and a sump cover plate in the lower end of said separator section including arcuate notches in the peripheral edge thereof for receiving corresponding inserted ends of said scraper bars for directing moisture into said sump, whereby incoming moisture-laden gas is cooled by said evaporator and condensed liquid is removed therefrom by said swirling movement and scraper bars to produce a cold, dry gas output through said outlet conduit.

4,689,970

CRYOGENIC APPARATUS

Hirotsugu Ohguma, Kawasaki; Mitsuo Harada, Yokohama; Hideaki Saura, Sagamihara, and Satoshi Yasuda, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 26, 1986, Ser. No. 878,576

Claims priority, application Japan, Jun. 29, 1985, 60-143766; May 12, 1986, 61-108142

Int. Cl.[4] F25B *19/00*

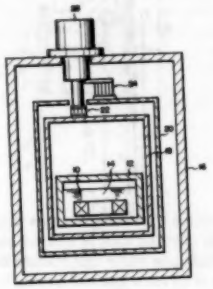
U.S. Cl. 62—514 R **7 Claims**

1. A cryogenic apparatus comprising a refrigerant vessel containing an object to be cooled and a refrigerant, a vacuum casing containing said refrigerant vessel, a radiation shield disposed between said refrigerant vessel and vacuum casing such as to enclose said refrigerant vessel for preventing the transfer of radiation heat to said refrigerant vessel, a refrigerator for cooling at least one of said radiation shield and said refrigerant vessel, and a thermal conductive coupling disposed between said refrigerator and at least one of said radiation shield and said refrigerant vessel, and turning on and off the transfer of heat between said refrigerator and at least one of said radiation shield and said refrigerant vessel, wherein said thermal conductive coupling includes:

a first member having high thermal conductivity and connected to said refrigerator; and

a second member having high thermal conductivity and connected to at least one of said radiation shield and said refrigerant vessel; wherein satisfactory heat transfer is obtained between said first and second members by supplying a heat conductive medium in the form of a fluid into a space defined between said first and second members; only slight heat transfer being caused by only heat radiation obtained between said first and second members by evacuating said space between said first and second members and wherein:

each one of said first and second members has a plurality of heat transfer members separated from each other;



the heat transfer members of said first member and the heat transfer members of said second member are alternately arranged with a small gap therebetween so as to face each other; and

said satisfactory heat transfer between said first and second members is obtained by heat conduction of said heat conductive medium, which is supplied into the small gaps between the heat transfer members of said first member and the heat transfer members of said second member.

4,689,971

PROCESS AND CIRCULAR KNITTING MACHINE FOR MANUFACTURING PANTYHOSE ARTICLES AND THE LIKE

Paolo Conti; Gianni Conti, both of Florence; Franco Gariboldi, Condove, and Benito Manini, Florence, all of Italy, assignors to Paolo Conti and Meritex S.r.l., both of, Italy

Filed Jul. 24, 1985, Ser. No. 758,540

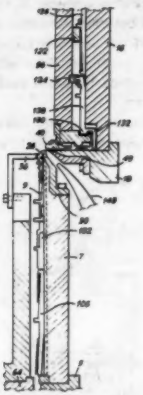
Claims priority, application Italy, Aug. 1, 1984, 9470 A/84

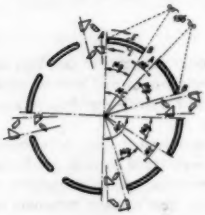
Int. Cl.[4] D04B *9/38, 9/42, 15/58, 1/24*

U.S. Cl. 66—25 **28 Claims**

1. A procedure for the formation of hosiery articles like stockings, pantyhose and panties, comprising, simultaneously forming a plurality of pairs of adjacent tubular leg-like articles on two non-rotating circular arched fronts of needles and by threads reciprocating transfer means, the tubular articles having rows of knitted threads that are alternatively formed by the two fronts through sets of needles whose number may vary, subsequently joining the adjacent tubular leg-like articles of each pair of each other, thereafter continuing the formation of rows of knitted thread to produce a tubular panties body por-

tion for a plurality of pantyhose articles that are simultaneously manufactured, and during a passage of the thread from one





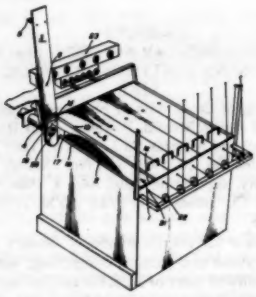
front to the other, shorter stitches are formed for recovering a possible thread excess.

4,689,972

YARN DRYING AND DYE SETTING APPARATUS

Frankie B. Stanley, Dalton, Ga., assignor to J. W. Yarbrough, Chatsworth, Ga., a part interest

Filed Sep. 30, 1985, Ser. No. 781,529
Int. Cl.[4] D06F *3/04*
U.S. Cl. 68—20 9 Claims



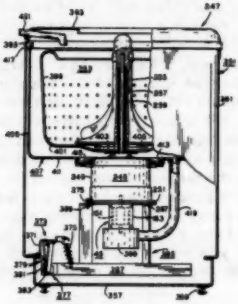
1. Drying and dye setting apparatus for a strand of yarn comprising an enclosure having air entry and exhaust ports, a yarn entry port and a yarn discharge port, means for circulating heated air within said enclosure, a reel rotatably mounted in said enclosure on which said yarn is wound, said reel comprising a pair of rotatably spaced side wheels, said reel having an axis, a plurality of rods fixedly secured to and extending between said spaced side wheels, each of said rods having a yarn entry end adjacent one of said side wheels and a yarn exit end adjacent the other of said side wheels, and the radius between said axis and said yarn entry ends being greater than the radius between said axis and said yarn exit ends and each of said rods being angularly disposed relative to an imaginary plane containing and intersecting said axis and the connection between each rod and said one side wheel.

4,689,973

LAUNDRY MACHINE DRIVE

Doran D. Hershberger, Sycamore, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 487,921, Apr. 22, 1983, which is a division of Ser. No. 304,536, Sep. 22, 1981, Pat. No. 4,434,546, which is a division of Ser. No. 77,784, Sep. 21, 1979, Pat. No. 4,327,302.
This application Dec. 17, 1986, Ser. No. 942,896
Int. Cl.[4] D06F *23/04, 37/40*
U.S. Cl. 68—23.7 7 Claims



1. A drive for a laundry machine having a DC power source associated therewith and means for agitating water and fabrics to be laundered thereby to wash the fabrics and for thereafter spinning the fabrics to effect centrifugal displacement of water from the fabrics, the drive comprising:

an electronically commutated motor adapted to be energized from the DC power source for driving the agitating and spinning means, said electronically commutated motor comprising a stator, a multi-stage winding arrangement associated with the stator and having a plurality of winding stages adapted to be electronically commutated in a plurality of preselected sequences, and a rotatable assembly associated with said stator and arranged in selective magnetic coupling relation with said winding stages so as to be rotatably driven thereby, said rotatable assembly being rotatably driven in one direction in response to the electronic commutation of at least some of said winding stages in one of the preselected sequences and also being rotatably driven in the one direction and another direction opposite thereto in response to the electronic commutation of said winding stages in another of the preselected sequences; and

means for driving the agitating and spinning means from said rotatable assembly of said electronically commutated motor.

4,689,974

SKIN HOLDER IN AN APPARATUS FOR LETTING OUT SKINS

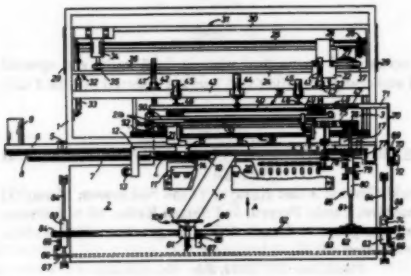
Herbert Dietrich, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Apr. 21, 1986, Ser. No. 854,322

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1985, 3514466

Int. Cl.[4] C14B *15/00, 17/06*

U.S. Cl. 69—27 8 Claims



1. In a device for letting out a skin to be cut and sewn at seam areas extending in a longitudinal direction and at an angle to an edge of the skin, the device comprising a pair of clamping jaws for clamping the skin at each seam area, jaw drive means for moving the jaws laterally of the longitudinal direction to clamp the skin at each seam area, a parting sword movable between the jaws and extending in a longitudinal direction, sword drive means connected to said sword for moving said sword in a longitudinal direction to form a furrow and upwardly to push the skin at each seam area between said jaws, cutting means for cutting the seam area after it is clamped by said clamping jaws, a sewing machine for sewing the seam area, a seam gripper for gripping the seam after it is sewn by said sewing machine and moving the seam downwardly of said clamping jaw and laterally of said longitudinal direction by a seam spacing amount corresponding to a distance between adjacent seam areas on the skin, and gripper drive means for moving said seam gripper upwardly and downwardly and laterally of the longitudinal direction for repositioning the skin to bring an additional seam area thereof into alignment with said parting sword, the improvement comprising holding means for receiving an end of at least one skin spaced from the seam areas, guide means for guiding the holding means for movement in the longitudinal direction and laterally of the longitudinal direction, and switchable drive means connected to said holding means for moving said holding means along said guide means for following movements of the seam areas of the skin due to said sword and gripper drive means.

4,689,975

PADLOCK

Gerald F. Dunphy, Glen Waverley, and Donald J. Newman, Sommerville, both of Australia, assignors to Ogden Industries Pty. Ltd., Huntingdale, Australia

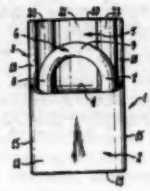
Filed Aug. 5, 1986, Ser. No. 902,597

Claims priority, application Australia, Aug. 15, 1985, PH 1959

Int. Cl.[4] E05B *67/38*

U.S. Cl. 70—56 10 Claims

1. A padlock comprising, a body, a U-shaped shackle having a portion which projects beyond an upper end surface of said body, said shackle being movable relative to said body between a locked condition and a released condition at which said shackle portion projects beyond said upper end surface by a minimum extent and a maximum extent respectively, said shackle having two parallel legs one of which is captured within said body against escape at all times and the other of which is located within and outside said body in locked and released conditions respectively, locking means within said body operable to engage said other leg to releasably hold said shackle against movement from the locked to the released condition, a shroud integral with said body and extending beyond said upper end surface by a distance greater than said minimum extent of said shackle portion, said shroud extending completely across a front side of said body, two spaced end



portions of said shroud extending towards a rear side of said body, each of said end portion at least partially overlapping a respective one of said shackle legs when said shackle is in said locked condition, said shroud forming a cavity in a rear side of said shroud between said end portions for substantially containing said shackle portion when the shackle is in said locked condition, said end portions forming an opening to allow said other shackle leg to move laterally relative to said shroud when the shackle is in said released condition so as to be thereby movable into and out of said cavity.

4,689,976

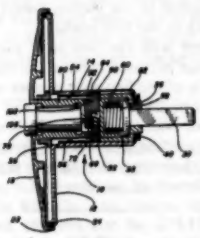
POP-UP HANDLE ASSEMBLY

Marvin L. Larsen, New Hampton, Iowa, assignor to Tri/Mark Corporation, New Hampton, Iowa

Filed Jun. 16, 1986, Ser. No. 874,402

Int. Cl.[4] E05B *13/00*

U.S. Cl. 70—208 21 Claims



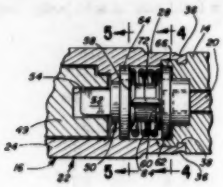
1. A pop-up T-handle assembly comprising, a base with a generally planar mounting panel for attachment to a support and a tubular housing, a T-handle having a section with a peripheral lip which in a handle-closed position encloses the mounting panel and precludes rotation of the T-handle, spring means urging the T-handle section away from the base to an operative position remote from said mounting panel, a drive-bar rotatably mounted by the tubular housing, means within the tubular housing for drivingly connecting the T-handle with the drive-bar, a depressible key-plug carried by the T-handle and movable between locked and unlocked positions, means preventing depression of the key-plug when in locked position, means locking the T-handle in closed position against the action of the spring means, and means operable upon depression of the key-plug to release said locking means and permit pop-up of the T-handle under the urging of the spring means.

4,689,977

SWITCH LOCK WITH TWO MOMENTARY POSITIONS

Stanley C. Wolniak, Vernon Hills, and Timothy P. Laabs, Des Plaines, both of Ill., assignors to The Eastern Company, Naugatuck, Conn.

Continuation-in-part of Ser. No. 646,790, Sep. 4, 1984, Pat. No. 4,633,689. This application Jul. 28, 1986, Ser. No. 889,738
Int. Cl.[4] H01H *27/06*; E05B *17/04*
U.S. Cl. 70—379 R 17 Claims



1. In a key operated switch including a lock having a barrel and rotatable plug with key actuated tumblers and a switch having a rotatable shaft, an improved switch actuator comprising:

an actuator member interconnecting the rotatable plug and the rotatable shaft;

first and second rotatable stop washers about the actuator member;

means for rotationally biasing the first and second stop washers in opposite directions;

a surface on the first stop washer which engages the actuator member upon rotation of the plug in one direction from a first position to a second position to rotate the first stop washer against the action of the biasing means;

a surface on the second stop washer which engages the actuator member upon rotation of the plug in the other direction from the first position to a third position to rotate the second stop washer against the action of the biasing means;

means for maintaining the first and second stop washers against the action of the biasing means in an orientation corresponding to the first position;

means associated with the first stop washer for allowing rotation of the actuator member in the other direction independently of the first stop washer to turn the switch from the first to the third position; and

means associated with the second stop washer for allowing rotation of the actuator member in the one direction independently of the second stop plate to turn the switch from the first to the second position.

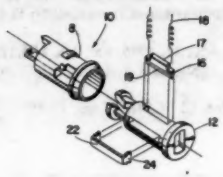
4,689,978

SIDE BAR WAFER LOCK, AN IMPROVED SPRING RETAINER FOR SAID LOCK, AND A METHOD OF USING SAID SPRING RETAINER IN SAID LOCK

Robert L. Drummond, 163 Woodlawn NW., Perry Heights, Canton, Ohio 44708

Filed Oct. 27, 1986, Ser. No. 923,766
Int. Cl.[4] E05B *17/00*
U.S. Cl. 70—431 17 Claims

1. In a side bar wafer lock consisting essentially of a housing; a metal plug adapted to fit into said housing and having at least one slot for receiving a spring retainer; a side bar, side bar springs, tumblers, and tumbler springs in a working relationship in said plug for controlling the movement of said side bar; and a spring retainer having at least one leg adapted to be inserted into said slot, for holding the tumbler springs in said plug, the improvement comprising a U-shaped spring retainer having barbed legs wherein barbs on said legs are formed by placing angled cuts in said legs and said barbs increase the width of said legs to a width wider than said slot when measured across said barbs, and wherein said barbs are upward angled and compress when said legs are inserted into said slot.

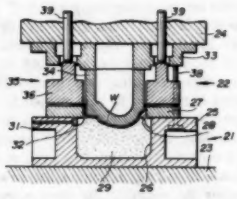


4,689,979

PRESSING METHOD AND PUNCH AND DIE PRESS FOR THE SAME

Nobuyuki Otsuka; Atsuo Kasuya; Yusho Nakayama; Masayuki Kumashiro; Tamio Furuya, and Shigeo Kaibo, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1984, Ser. No. 684,018
Claims priority, application Japan, Dec. 21, 1983, 58-241644
Int. Cl.[4] B21D *22/10*
U.S. Cl. 72—57 14 Claims



1. A method of pressing a blank, comprising the steps of:

(a) pressing the blank between a die assembly having a cavity containing a highly viscous substance with dilatant and thixotropic properties therein, and a punch;

(b) inserting said punch into said cavity to increase a pressure of the highly viscous substance in said cavity; and

(c) pressing said blank against a surface of said punch under said pressure of said highly viscous substance such that the pressure of said highly viscous substance does not reach a final pressing pressure until said punch closely approaches a final insertion depth on said cavity.

4,689,980

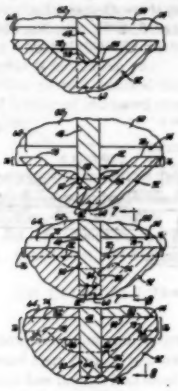
METHOD FOR SNAP RING FORMING AND GROOVING

James T. Killop, Warren, and Gerald W. Holbrook, Saint Clair, both of Mich., assignors to Anderson-Cook, Inc., Fraser, Mich.

Division of Ser. No. 769,581, Aug. 25, 1985, Pat. No. 4,644,772. This application Sep. 15, 1986, Ser. No. 907,475
Int. Cl.[4] B21D *17/04*
U.S. Cl. 72—88 6 Claims

1. A method for simultaneously forming splines and an annular groove in a metal workpiece having central portions and ends on each side thereof, said method including the steps of: forming a substantially U-shaped annular recess (56) along the central portion of the workpiece which has a flat base and spaced side walls which are spaced apart to a greater distance than the side walls of the groove (82) to be formed; deforming the recess (56) to initially form a groove (82) therein; progressively and simultaneously forming splines in the ends of the

workpiece and forming the groove (82) in the recess of the workpiece and moving metal outwardly and upwardly from



the recess as the groove (82) is formed to fill the remainder of the recess (56) and form the side walls of the groove (82).

4,689,981

DRAW-BENDING METHOD

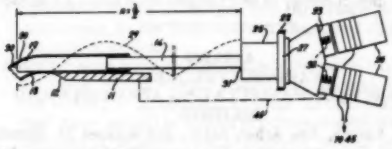
Ibrahim N. Ibrahim, Cairo, Egypt, and Dennis H. Sansome, Sutton Coldfield, England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 628,603, Jul. 6, 1984, abandoned. This application Jun. 30, 1986, Ser. No. 880,099

Claims priority, application United Kingdom, Jul. 8, 1983, 8318577

Int. Cl.[4] B21D *9/05*

U.S. Cl. 72—150 **1 Claim**



1. A method of draw-bending an elongated workpiece of hollow section with apparatus including a bend former, support means to contact the outer surface of the workpiece, drawing means for gripping the workpiece and drawing the workpiece in a bend around the former and an elongated mandrel assembly having one end anchored to a fixed structure of the apparatus and presenting at an end opposite said one end a mandrel means for disposition within the workpiece close to said bend former, said mandrel means including a forward nose part presenting a surface which faces generally radially outward relative to a bend to be formed in the workpiece, said appartus further including first vibration transducers attached to said mandrel assembly, the steps comprising:

gripping a portion of the workpiece with the drawing means and imparting movement to said drawing means to effect bending of the workpiece over the bend former, while disposing the nose part of the mandrel within the workpiece in sliding and supporting contact with the inner surface of that part of the wall of the workpiece lying on the outside of the bend being formed;

supporting the outer surface of the workpiece to define a first axis of drawing movement for the workpiece upstream of the bend former with said drawing means being disposed downstream of the bend former, said drawing means moving by virtue of said movement to a position in which said workpiece gripped by said means defines a second axis of drawing movement extending at an angle to said first axis;

imposing on said workpiece a standing wave of resonant vibration with the first vibration transducers, the standing wave extending in a direction aligned with said first axis of drawing movement and out of alignment with said second axis and with the first vibration transducers and said workpiece being without direct attachment therebetween; and

continuing said movement of said drawing means without substantially changing the cross-section of said workpiece as bending of said workpiece is accomplished.

4,689,982

METHOD FOR MAKING A CAGE AND THE CAGE PRODUCED THEREBY

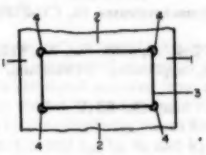
Armin Olschewski, Schweinfurt; Hermann Hetterich, Heidenfeld; Peter Horling, Mainberg, and Robert Stolz, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 795,824

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440962

Int. Cl.[4] B21D *53/12*

U.S. Cl. 72—334 **1 Claim**



1. A method for producing a cage, especially a roller cage of sheet material by punching out the roller element pockets of a predetermined shape having corner areas, consisting of the steps of localized stamping the sheet material in the direction of the sheet thickness in the corner areas only to provide a densified transition zone in said corner areas only and thereafter forming the pockets by a punching operation through the transition zone.

4,689,983

METHOD FOR PRODUCING WORM SHAFT FOR USE IN POWER STEERING APPARATUS

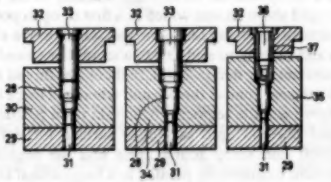
Naosuke Masuda, and Sohsuke Sunaga, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,171

Claims priority, application Japan, Jan. 14, 1983, 58-4787

Int. Cl.[4] B21D *22/26, 22/28*

U.S. Cl. 72—356 **3 Claims**



1. In a method for producing a worm shaft for use in a power steering apparatus, said worm shaft having first and second end

portions, said power steering apparatus comprising an input shaft, a rotation control valve including said worm shaft and a valve rotor fitted in a valve sleeve formed at said first end portion of said worm shaft, said method including the steps of forming said valve sleeve, forming fluid control passages on an inner peripheral portion of said valve sleeve, and forming a plurality of parallel ribs on an inner peripheral portion of said worm shaft toward said second end portion thereof, said ribs being physically separate from said fluid control passages, with a predetermined gap formed radially between said ribs for permitting a predetermined amount of relative rotation between said worm shaft and said input shaft, the improvement comprising the step of aligning said ribs and said fluid control passages by simultaneously forming said ribs and said fluid control passages by plastic working.

4,689,984

METHOD FOR PRODUCING MALE CONICAL THREADS

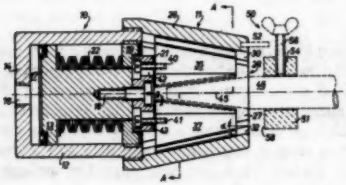
Urs Kellner, Hüttenackerstrasse 10, CH-8712 Stäfa, Switzerland

Filed Dec. 23, 1985, Ser. No. 812,275

Claims priority, application Switzerland, Jan. 10, 1985, 103/85

Int. Cl.[4] B21K *1/56*

U.S. Cl. 72—402 **8 Claims**



1. A method of forming an external conical thread having a generally tapered outer contour at an end portion of an elongated structure made of steel; said method comprising the steps of:

shaping said end portion into a cone corresponding to said outer contour and having a generally smooth outer surface; and

deforming said surface of said cone by cold-pressing so as to form said thread;

said cold-pressing being effected by applying onto said surface a composite die including a plurality of die segments arranged about an axis which in a first or open position are capable of receiving said cone and which move along said axis and radially to said axis to a second or closed position to substantially define an internal conical thread matching said external conical thread; and wherein a force is applied to move said die segments from said open position to said closed position onto said cone surface for deformation thereof; said force acting upon said die segments in a direction substantially parallel to a longitudinal axis of said cone; and wherein each of said segments is guided into said closed position to move in a direction toward said cone surface which direction intersects with said longitudinal axis at an acute angle or below about 20°.

4,689,985

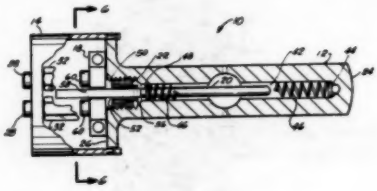
CALIBRATION IMPACT HAMMER

Samuel W. Glass, III, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 5, 1986, Ser. No. 836,377

Int. Cl.[4] G01L *1/00*

U.S. Cl. 73—1 R **14 Claims**



1. A calibration impact hammer, comprising:

(a) a head with first and second ends having a longitudinal bore extending from said second end toward said first end, said longitudinal bore being threaded at said second end;

(b) an inertia rod slidably received within said longitudinal bore and movable between a first normal retracted position and a second inserted position;

(c) means in said longitudinal bore for biasing said inertia rod toward said first normal position;

(d) optical switch means mounted on said second end of said head;

(e) means on said inertia rod for activating said optical switch means upon movement of said inertia rod between said first and second positions;

(f) means threadably engaged in said longitudinal bore for slidably receiving and adjusting the position of said inertia rod relative to said optical switch means; and

(g) display means connected to said optical switch means for receiving signals therefrom and calculating and displaying the impact energy of said hammer upon striking a surface.

4,689,986

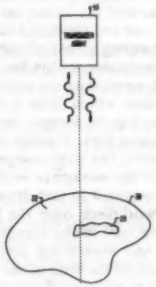
VARIABLE FREQUENCY GAS-BUBBLE-MANIPULATING APPARATUS AND METHOD

Paul L. Carson, Ann Arbor, Mich., and Richard M. Detsch, Denver, Colo., assignors to The University of Michigan, Ann Arbor, Mich.

Filed Mar. 13, 1985, Ser. No. 711,255

Int. Cl.[4] G01N *29/02*

U.S. Cl. 73—19 **32 Claims**



1. A bubble detection method of the type which utilizes ultrasonic acoustical energy to detect a bubble-containing

region within a specimen, the bubble detection method comprising the steps of:

emitting from an ultrasonic transducer the acoustical energy into the bubble-containing region within the specimen;

decreasing the frequency of the acoustical energy with respect to time whereby the size of a bubble in the bubble-containing region is increased; and

receiving a portion of said emitted acoustical energy reflected by said bubble of increased size within the bubble-containing region.

4,689,987

LEAKAGE DETECTION WITH FLEXIBLE BAG

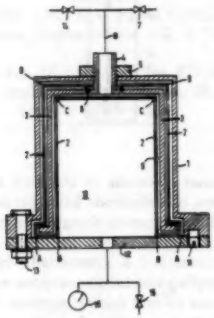
Mathias L. C. Aarts, Biltboven, Netherlands, assignor to Product Suppliers AG, Zug, Switzerland

Filed Jul. 16, 1986, Ser. No. 886,522

Claims priority, application Netherlands, Jul. 17, 1985, 8502062

Int. Cl.⁴ G01M *3/32*

U.S. Cl. 73—49.3 **5 Claims**



1. A bag for use in leak testing vacuum packages having a predetermined shape, comprising:

a rigid frame having (i) an open end, (ii) a shape generally comforming to the predetermined shape, and (iii) inside and outside surfaces;

a flexible inner layer extending along the inside surface of the frame, having a shape generally conforming thereto, and forming (i) an open end adjacent the open end of the rigid frame, and (ii) an interior in communication with said open end of the inner layer to receive a vacuum package;

a flexible outer layer extending along the outside surface of the frame and having a shape generally conforming thereto;

the inner and outer layers forming an internal space, and being connected to each other adjacent the open ends of the frame and the inner layer to close said internal space adjacent said open ends; and

inlet means in communication with said internal space to conduct gas into the internal space to urge the inner and outer layers away from the frame, and to conduct gas out from the internal space to collapse the inner and outer layers onto the frame.

4,689,988

DEVICE FOR SEPARATELY MEASURING PARTICLES IN A SUSPENSION

Staffan Rydefalk, Vallentuna, and Jens Einarsson, Stockholm, both of Sweden, assignors to Svenska Traforskningsinstitutet, Stockholm, Sweden

PCT No.: PCT/SE85/00073, § 371 Date Oct. 15, 1985, § 102(e) Date Oct. 15, 1985

PCT Pub. No. WO85/03774, PCT Pub. Date Aug. 29, 1985

PCT filed Feb. 13, 1985, Ser. No. 795,347

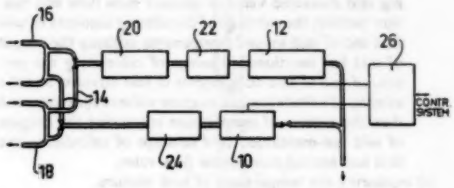
Claims priority, application Sweden, Feb. 14, 1984, 8400784

Int. Cl.⁴ G01N *15/07*

U.S. Cl. 73—61 R **9 Claims**

1. A device for measuring individually the content of each of at least two types of substances in a suspension wherein the density of each substance is approximately equal and known, said device comprising:

a density meter for measuring the density of the suspension and the density of the liquid in which the substances are suspended, in order to determine the difference in density; measuring means for measuring particle concentration and the ratio of the volume of the suspended substances and the liquid; and calculating means electrically connected to said density meter and measuring means to adjust the signal received from the density meter by use of the signal received from the measuring means according to the relationship:



$$S_F = k_a U_a + k_b U_2$$

$$S_M = k_c U_1 + k_d U_2$$

where S_F is the content of suspended substance of the first type substance, S_M is the content of suspended substances of the second type, U_1 is the signal received from the density meter by the calculating means, U_2 is the signal received from the measuring means by the calculating means for measurement of particle concentration and k_a, k_b, k_c and k_d are constants of proportionality.

4,689,989

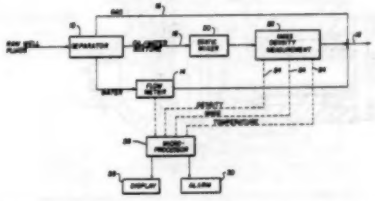
METHOD AND APPARATUS FOR TESTING THE OUTFLOW FROM HYDROCARBON WELLS ON SITE

Kerby S. Aslesen, Vernal, Utah; John R. Bocek; Dennis R. Canfield, both of Casper, Wyo., and Ke-Tien Liu, Sugar Land, Tex., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 24, 1985, Ser. No. 747,706

Int. Cl.⁴ G01F *5/00*

U.S. Cl. 73—61.1 R **32 Claims**



29. A method of determining the amounts of a first and of a second component in a flowing mixture comprising said first and second components, said first and second components being liquids and having different densities, comprising the steps of:

(a) measuring the mass flow of said mixture;

(b) determining the density of said mixture;

(c) obtaining values for the densities of said first and second components;

(d) calculating the amounts of said first and second compo-

nents in said mixture based on said measured mixture mass flow rate, measured mixture density, and said first and second component obtained values for their said densities, said step of calculating amounts including the substeps of

(i) calculating the density of said first and second components at said measured temperature, utilizing said measured temperature and said values for the densities and the thermal coefficients of expansion of said first and second components,

(ii) calculating the percent of one of said first and second components in said mixture utilizing the measured mixture density and the previously calculated values for the densities of said first and second components,

(iii) calculating the volume flow rate of the mixture utilizing said measured value of mixture mass flow and mixture density, the substeps of calculating amounts of said first and of said second components utilizing the output of said last mentioned substeps of calculating the percent of one of said components in said mixture, and the substep of calculating the mixture volume flow rate, and then the substep of temperature correcting the outputs of said last-mentioned two substeps of calculating the first and second component flow rates;

(e) measuring the temperature of said mixture,

(f) obtaining values for the thermal coefficients of expansion of said first and of said second components,

(g) performing said calculating amounts step to include said measured mixture temperature and said thermal coefficients values to correct said calculated amounts for the difference in temperature between the measured temperature of said mixture and a predetermined reference temperature.

4,689,990

APPARATUS FOR THE ACQUISITION OF SPEED-OF-ROTATION AND/OR ANGLE OF ROTATION SIGNALS ON A DRIVE SHAFT

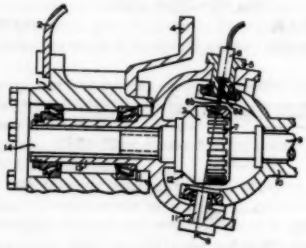
Siegfried Hofler, Hanover; Konrad Rode, Seelze, and Reinhard Schmidt, Lehrte, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 12, 1986, Ser. No. 873,735

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521606

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—118.1 **14 Claims**



1. An apparatus to detect the rotation of a shaft, comprising two shafts, a universal joint which connects said two shafts so that said shafts rotate together, at least one of said shafts is mounted radially in a swivel housing, and is pivotable with said housing around a pivot axis generally passing through the midpoint of said joint, transmitter means for indicating rotational position of said joint located on the circumference of said joint, a sensor means for detecting movement of said transmitter means, and said sensor means being located on said pivot axis.

4,689,991

FLUID-GAUGING PROBES AND THEIR MANUFACTURE

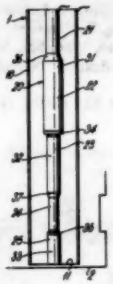
Keith A. Beckley, Cheltenham; Neil R. Jacob, and Geoffrey A. Trussler, both of Basingstoke, all of England, assignors to Smiths Industries Public Limited Company, London, England

Filed May 13, 1986, Ser. No. 862,871

Claims priority, application United Kingdom, May 22, 1985, 8512907

Int. Cl.[4] G01F *23/26*; H01G *5/28*

U.S. Cl. 73—304 C **10 Claims**



1. A tubular inner electrode of the kind for a capacitive fluid-gauging probe, said electrode having at least three different diameters at different points along its length, the improvement wherein said inner electrode comprises at least two discrete tubular sections and a substantially cylindrical metal coupling piece coupling said tubular sections with one another, wherein at least one of said tubular sections consists of only two cylindrical regions, namely a first region of one diameter providing a first end of the tubular section and a second region integral with said first region providing an opposite end of the tubular section, said second region having a second diameter formed by mechanically reducing the diameter of the section from that of said first region, wherein one end of said coupling piece projects within one end of said one tubular section, and wherein the other end of said coupling piece projects within one end of the said other tubular section, the said one end of said one tubular section having a diameter different from that of the said one end of the said other tubular section.

4,689,992

ROTATION RATE SENSOR

John S. Strachan, Edinburgh, Scotland, assignor to Syrinx Innovations Limited, Edinburgh, Scotland

PCT No. PCT/GB85/00131, § 371 Date Dec. 4, 1985, § 102(e) Date Dec. 4, 1985, PCT Pub. No. WO85/04722, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 1, 1985, Ser. No. 809,889

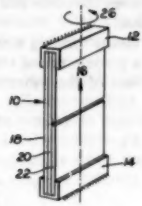
Claims priority, application United Kingdom, Apr. 4, 1984, 8408659

Int. Cl.[4] G01P *9/04*; H01L *41/08*

U.S. Cl. 73—505 **5 Claims**

1. A device for measuring rotation, comprising a laminar assembly and means mounting said assembly so as to lie, in a rest condition, in a reference plane containing a central longitudinal axis; said assembly comprising a first piezoelectric member connected to an oscillator to produce oscillation of said assembly transvorco to said reference plane, and a second piezo electric member arranged to generate an electrical output when stressed in a direction oblique to said oscillation, said second piezoelectric member comprising two polarized polymeric piezoelectric films arranged in a common plane along

said axis each with a main uniaxial mode transverse to said axis, and connected together in series; whereby said electrical output is a function of twisting of said assembly about said axis and between said films.

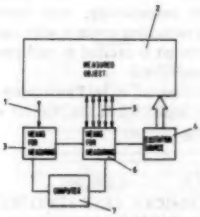


4,689,993

MEASURING AND MAPPING VIBRATIONS

Gudmunn Slettemoen, Tonstadgrenda 252, N-7075 Tiller, Norway

Filed Jun. 18, 1986, Ser. No. 875,643
Claims priority, application Norway, Jun. 28, 1985, 852615
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—579 **21 Claims**



2. A device for measuring and mapping vibrations, comprising:

at least one local sensor;

a first means for measuring associated with said local sensor for making local registrations and frequency decompositions of the vibrations of an oscillating object to be examined;

an image forming unit;

a second means for measuring associated with said image forming unit to be used in combination with said local sensors and said first means for measuring to provide image-forming recording and local recording of the vibrations of an oscillating object, respectively;

an oscillating source of excitation which causes the object to be examined to oscillate harmonically; and

a means for calculation to collocate said local recordings and image-forming recordings.

4,689,994

DELIVERY SYSTEM FOR A REMOTE SENSOR

Alan Savinell, Penn Hills Twp., Allegheny County, and Jeffrey E. Hydeman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

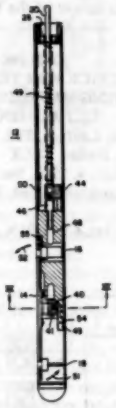
Filed Nov. 9, 1984, Ser. No. 670,421
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—634 **44 Claims**

1. A mechanical delivery system for remotely positioning a sensor in mating engagement with a predetermined portion of a component to be inspected, comprising:

elongated support means for positioning a sensor, said elongate support means having a first end adapted for manipulation from a remote location and a second end having a housing;

a sensor having a sensor portion adapted for mating engagement with the predetermined portion of the component to be inspected; and

mounting means for mounting said sensor to said support means at said second end of said support means, said mounting means movable between a first position and a second position, said mounting means positioning said sensor portion within said housing when in said first position and positioning said sensor portion extending laterally of said housing when in said second position to thereby enable said sensor portion to be placed in mating engagement with the predetermined portion of the component as a result of manipulation of said first end.

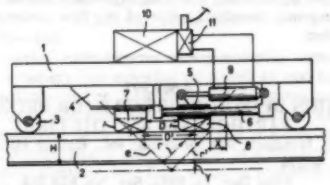


4,689,995

METHOD AND APPARATUS FOR THE NON-DESTRUCTIVE TESTING OF RAILROAD TRACK RAILS

Jean Pierre Turbe, Nanteuil-les-Meaux, France, assignor to Societe Nationale des Chemins de Fer Francais, Paris, France

PCT No. PCT/FR85/00058, § 371 Date Nov. 19, 1985, § 102(e) Date Nov. 19, 1985, PCT Pub. No. WO85/04484, PCT Pub. Date Oct. 10, 1985
PCT Filed Mar. 22, 1985, Ser. No. 807,881
Claims priority, application France, Mar. 23, 1984, 84 04523
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—636 **8 Claims**



1. A method for non-destructively and continuously testing railroad track rails, in situ, to determine the presence of faults, comprising the steps of:

(a) transmitting a beam of ultrasonic waves into a rail using a first transducer disposed in sliding contact with an upper surface of the rail,

(b) receiving signals of said beam reflected by a lower sur-

face of the rail using a second transducer disposed in sliding contact with the surface of the rail,

(c) comparing time displaced reflected signals to determine the magnitude and direction of any changes in the strength of the reflected signals, and

(d) displacing said second transducer in a direction parallel to the longitudinal direction of the rail in accordance with the comparison determinations to maximize the strength of the reflected signals and to thereby compensate for any variations in the height of the rail.

4,689,996

METHOD AND DEVICE FOR TESTING ELECTRICALLY CONDUCTING OBJECTS BY MEANS OF ULTRA-SONICS

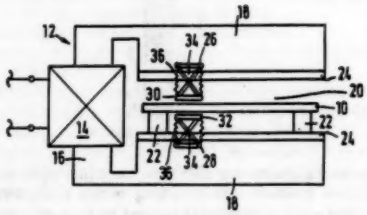
Gerhard Hüschelrath, Laufach, Fed. Rep. of Germany, assignor to Nukem GmbH, Hanau, Del.X

Filed Apr. 4, 1985, Ser. No. 719,957

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413787

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—643 **9 Claims**



1. An apparatus for performing non-destructive testing of an electroconductive plane object, said apparatus comprising:

a magnet being substantially U-shaped, with the poles of said magnet extending along opposite arms of the U-shape, the object to be tested being placed between the poles of the magnet

an electrodynamic transmitting probe being arranged between a first surface of the test object and one of the poles of said magnet;

a coordinated receiving probe being arranged between a second surface of the test piece and the other pole of said magnet;

said transmitting and receiving probes being moved synchronously oscillatorily over the test object along the poles at a constant preset distance to the respective first and second surfaces; and

a flaw detector and a wall thickness measuring instrument for generating an output signal proportional to the thickness of the wall connected to the receiving probe, the output signal being fed to an adjustment circuit by which a response threshold value of the flaw detector can be varied.

4,689,997

MOTION DETECTOR SUITABLE FOR DETECTING EARTHQUAKES AND THE LIKE

David E. Windisch, 904 Silverspur Rd., Rolling Hills Estates, Calif. 90274

Filed Dec. 24, 1985, Ser. No. 813,264

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 73—652 **11 Claims**

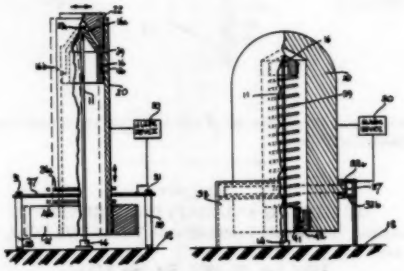
1. A motion detector device suitable for detecting vibrational tremors such as earthquakes comprising:

an inertial mass,

spring means comprising a spring barb oriented principally for motion along a horizontal axis and a coil spring oriented principally for motion along a vertical axis,

means for resiliently supporting said inertial mass on said spring means for resilient motion along both said horizontal and vertical axes comprising means for anchoring said spring barb at one end thereof and means for connecting said coil spring between the other end of said spring barb and said inertial mass,

said mass and spring means forming a resonant mechanical vibration circuit at a predetermined vibrational frequency corresponding to that of the vibrational tremor to be detected,



spaced apart oppositely positioned electrical switching contact means connected to said spring means and said inertial mass respectively, said contact means being brought into switching contact with each other when said vibrational circuit is excited at said predetermined vibrational frequency, and

alarm means connected to said switching means for providing an alarm signal when the contact means are brought into switching contact.

4,689,998

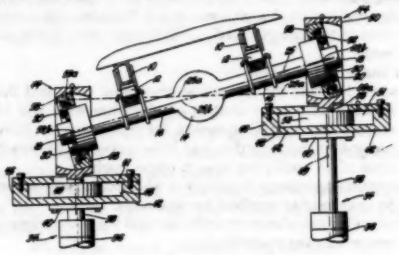
WHEELED VEHICLE TEST FIXTURE CONNECTOR

Gerald W. Jackson, 29526 Pearson, Selfridge, Mich. 48045, and David S. Rohweder, 4973 10 Mile Rd. Apt. #6, Warren, Mich. 48091

Filed Sep. 15, 1986, Ser. No. 907,424

Int. Cl.⁴ G01N *29/00*

U.S. Cl. 73—669 **4 Claims**



1. In a shaker mechanism for wheeled vehicles, wherein each vehicle has a plural number of axles, each axle including a rotary hub and a plural number of threaded studs centered in a ring pattern around the axle axis; said shaker mechanism comprising a plural number of fixtures, one for each axle; and a powered actuator supportably connected to each fixture for imparting vertical oscillatory forces thereto:

the improvement wherein each fixture comprises an annular housing; an annular axle-support element located within each housing for universal rotary motion around a point on the axle axis; and an annular adapter plate removably attached to each axle-support element; each adapter plate

having a number of circumferentially-spaced openings therethrough arranged in the same ring pattern as the aforementioned studs, whereby each said adapter plate can be fitted onto an axle hub with the studs extending through the adapter plate openings; and nuts threaded onto the studs to rigidly secure the adapter plate to the hub;

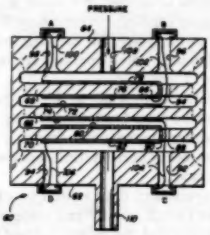
the adapter plates being sufficiently sized so that adapter plates having different numbers of stud openings therethrough can be removably attached to a given axle-support element, thereby achieving a significant commonality of fixture components while continuing to use existing fixtures with a range of different wheeled vehicles.

4,689,999

TEMPERATURE COMPENSATED PRESSURE TRANSDUCER

Zvi Shkedi, Los Angeles, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 26, 1985, Ser. No. 759,626
Int. Cl.[4] G01L *7/08, 9/12, 19/04*
U.S. Cl. 73—708 **31 Claims**



1. A pressure transducer comprising:

a housing portion;

a first diaphragm having a first electrode on one side thereof and a second electrode on the other side thereof, said first diaphragm being located adjacent to and spaced apart from said housing portion with said first electrode facing said housing portion and said second electrode facing away from said housing portion;

a second diaphragm having a third electrode on one side thereof and a fourth electrode on the other side thereof, said second diaphragm being located adjacent to and spaced apart from said first diaphragm with the side of said second diaphragm having said third electrode thereon facing the side of said first diaphragm having said second electrode thereon;

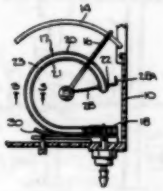
a third diaphragm having a fifth electrode on one side thereof and a sixth electrode on the other side thereof, said third diaphragm being located adjacent to and spaced apart from said second diaphragm with the side of said third diaphragm having said fifth electrode thereon facing the side of said second diaphragm having said fourth electrode thereon, wherein a first capacitance C_1 is present across said fourth and fifth electrodes and a second capacitance C_2 is present across said second and third electrodes, and one of said first, second, and third diaphragms is responsive to a pressure input to cause a change in at least one of said first and second capacitances C_1 and C_2 as the pressure input changes.

4,690,000

DIRECT-ACTING PRESSURE SENSOR

Siegfried H. A. Schmaus, 806 Powder Mill La., Penfield Downs, Philadelphia, Pa. 19151

Filed Jun. 19, 1986, Ser. No. 875,959
Int. Cl.[4] G01L *7/04*
U.S. Cl. 73—741 **5 Claims**



1. A fluid pressure sensor comprising:

(A) inner and outer flat springs having similarly curved formations and maintained in concentric relation to define a pressure region therebetween;

(B) a fixed fluid input socket anchoring said springs at one end thereof, the free end of the springs being joined to form a tip whose travel is indicative of fluid pressure, said tip having a hollow rivet attached thereto;

(C) a flexible bladder occupying said region and having an internal chamber, the faces of said bladder engaging said springs, said internal chamber communicating with said fluid input socket whereby the fluid pressure applied to said chamber through said socket imposes a load on said springs producing deflection thereof whereby said tip is caused to travel, said bladder being fabricated of a sleeve formed of elastomeric material incorporating a helical reinforcing coil whose convolutions are spaced from each other and are joined by said elastomeric material whereby the bladder is free to flex when subjected to fluid pressure but is prevented by the coil from dilating, thereby maintaining a proportional relationship between the applied fluid pressure and the travel of the tip; and

(D) a pointer operatively coupled to the tip and swingable along a scale graduated in pressure values, said pointer being anchored on a rotatable post to which is secured one end of a wire-like lever which extends through said hollow rivet and is slidable therein whereby the travel of the tip is converted into a pressure indication.

4,690,001

OPTICAL DISPLACEMENT TRANSDUCER USABLE AS AN EXTENSOMETER

Dennis N. Harvey, Chaska, Minn., and Robert B. Bertolasi, Rockford, Ill., assignors to MTS Systems Corporation, Eden Prairie, Minn.

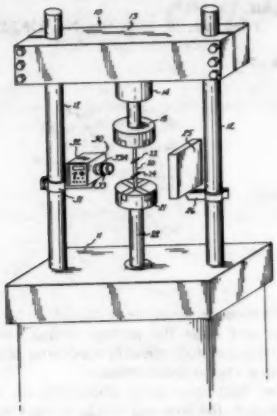
Filed Nov. 13, 1985, Ser. No. 797,435
Int. Cl.[4] G01L *1/24*
U.S. Cl. 73—800 **7 Claims**

3. An optical extensometer sensor assembly comprising a housing, a camera lens mounted on a wall of said housing, a circuit card mounted on the interior of said housing and including an array of individual light sensitive elements arranged in a linear relationship to represent the length of a specimen to be sensed and providing a voltage signal as a function of light striking such elements, said light sensitive elements being repeatably scanned at a desired clock rate;

an exterior light and dark display mounted on said housing comprising a plurality of light emitting elements which provide light in response to a voltage signal and arranged in linear array, and;

a separate plurality of adjacent ones of said light sensitive elements being coupled to each one of the light emitting elements at corresponding locations on the array and display to provide a light signal on the display when any

one of the light sensitive elements coupled to a light emitting element produces an output signal above a threshold



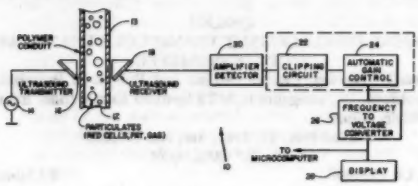
level to provide a visual display external of the housing of the conditions of the light sensitive elements.

4,690,002

DOPPLER SYSTEM FOR MEASUREMENT OF BLOOD FLOW DURING CARDIOPULMONARY BYPASS AND VENTRICULAR ASSIST

Lloyd C. Hubbard, Minnetonka, and Earl W. Clausen, Wayzata, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 14, 1986, Ser. No. 863,128
Int. Cl.[4] G01F *1/66*
U.S. Cl. 73—861.25 **6 Claims**



4. An ultrasonic flow measurement system for measuring velocity of blood flow through a conduit, the system comprising:

means for producing a Doppler signal having a frequency which varies as a function of the velocity of blood flow;

means for controlling amplification of the Doppler signal to compensate for variations in Doppler signal strength due to variations in red blood cell concentration in the blood; and

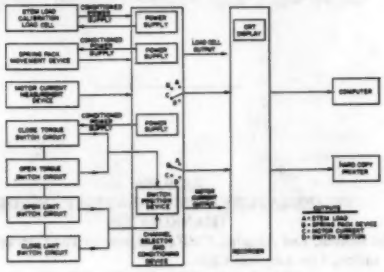
means for preventing inordinate reduction in amplification of the Doppler signal due to presence of particulates in the blood having higher ultrasonic reflectivity than red blood cells.

4,690,003

MOTOR OPERATED VALVE ANALYSIS AND TESTING SYSTEM

John A. McNennamy, Cobb, and Steven Nafziger, Gwinnett, both of Ga., assignors to Charbonneau & Godfrey Associates, Marietta, Ga.

Continuation of Ser. No. 515,358, Jul. 19, 1983, Pat. No. 4,542,649. This application Jun. 6, 1985, Ser. No. 741,861
The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.
Int. Cl.[4] G01M *19/00*; G01L *5/00*
U.S. Cl. 73—862.32 **32 Claims**



1. Method for determining and evaluating the general material and operational condition of a valve and/or an associated operator thereof said method comprising:

monitoring a drive system for said operator;

providing a dynamic valve operator spring pack movement-/time trace;

correlating valve stem load to spring pack movement to provide a valve stem load/time trace;

providing a motor current/time trace;

correlating the motor current/time trace with the valve stem load/time trace;

providing a torque and limit switch on-off/time trace;

correlating the switch on-off/time trace with the valve stem load/time trace and the motor current/time trace; and

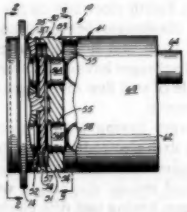
diagnosing the correlated traces to evaluate the condition of the valve and/or valve operator.

4,690,004

VARIABLE-RELUCTANCE TRANSDUCER

John R. Tavis, 3634 Highway 49, Mariposa, Calif. 95338

Filed Aug. 14, 1986, Ser. No. 896,748
Int. Cl.[4] G01L *1/14, 9/10*
U.S. Cl. 73—862.64 **4 Claims**



4. A variable-reluctance pressure transducer, comprising:

a housing;

a deflectable force-summing diaphragm mounted at one end of the housing to be movable with respect to the housing responsive to pressure applied to a front surface of the diaphragm;

two pairs of magnetic sensors, the pairs being spaced apart, and the sensors in each pair being spaced apart by a gap;

a post secured to the diaphragm and extending rearwardly with respect to the diaphragm front surface and generally between the two pairs of sensors;

a beam secured to the post and projecting laterally from opposite sides of the post to extend into the gap between each pair of sensors, so movement of the beam responsive to pressure-caused movement of the diaphragm and post varies spacing of the beam from each sensor to change magnetic-circuit reluctance of each sensor and thereby to vary inductance of each sensor.

4,690,005

DILUTING DOSAGE DEVICE

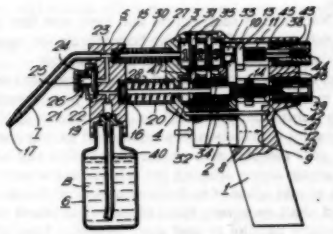
Jukka Tervamäki, Helsinki, and Kari Järvimäki, Espoo, both of Finland, assignors to Labsystems Oy, Helsinki, Finland

Filed Nov. 1, 1985, Ser. No. 794,104

Claims priority, application Finland, Nov. 2, 1984, 844320

Int. Cl.⁴ B01L *3/02*; G01N *1/14*

U.S. Cl. 73—864.12 **9 Claims**



1. Diluting dosage device for the dilution and dosage of liquids, which said device includes a handle (1), in which there is a dilution-liquid cylinder (20) open at one end, and in said cylinder a sealed first piston (16) provided with a first piston rod (12), said first piston being connected with a first spring (28), which presses the first piston towards the open end of the dilution-liquid cylinder; in which said handle there is further a sample cylinder (30) open at one end and therein correspondingly a second piston (15) provided with a second rod (11), the second piston being connected with a second spring (27), which presses the second piston towards the open end of the sample cylinder, in which said handle there is further an operating knob (2) engaging the said piston rods for pulling said pistons apart from the open ends of their cylinders; and a valve unit (5), in which there is a dilution-liquid duct (22) provided with a side branch, one end of the said dilution-liquid duct (22) communicating with the open end of said dilution-liquid cylinder and the other end of the said dilution-liquid duct (22) being provided with a suction valve (19), which valve is open when there is a negative pressure in said dilution-liquid duct, and closed when there is a positive pressure in said dilution-liquid duct, in which said valve unit there is further a sample duct (23) provided with a side branch, one end of the said sample duct (23) communicating with the open end of said sample cylinder and the other end of the said sample duct (23) being open, and in which said valve unit the side branch of said dilution-liquid duct and the side branch of said sample duct communicate with each other via a blocking valve (21), which blocking valve is closed when there is a negative pressure in said dilution-liquid duct, and open when there is a positive pressure in said dilution-liquid duct.

4,690,006

JIG FOR CARRYING OUT MOVEMENT AND ALIGNMENT WITHIN A PIPE

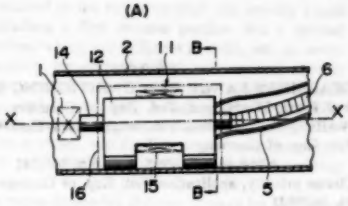
Toshimitsu Urata, Kawasaki, Japan, assignor to Kensa Giken Co., Ltd., Kanagawa, Japan

Filed May 29, 1986, Ser. No. 867,966

Claims priority, application Japan, May 30, 1985, 60-117416

Int. Cl.⁴ G01M *19/00*

U.S. Cl. 73—866.5 **11 Claims**



1. A jig for carrying out movement and alignment within a pipe comprising:

a magnet including a barrel portion having a smaller diameter than the diameter of the pipe and magnetic poles radially extending from the barrel portion to form a pair of ends formed in such a configuration that the ends constitute a part of the side of an annular column having a diameter slightly smaller than that of the pipe, the pole ends circumferentially extending within a lower portion of the pipe;

a cylindrical bore formed in said barrel portion, said cylindrical bore being aligned coaxially with an axis of said column; and

an instrument mounting shaft which is rotatably fitted through said cylindrical bore.

4,690,007

GYROSCOPE

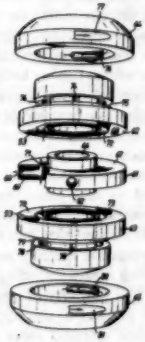
John A. G. Moles, and Colbert M. McMahon, both of Belfast, Northern Ireland, assignors to Short Brothers PLC, Belfast, Northern Ireland

Filed Mar. 5, 1986, Ser. No. 836,533

Claims priority, application United Kingdom, Mar. 5, 1985, 8505674

Int. Cl.⁴ G01C *19/12, 19/26*

U.S. Cl. 74—5.12 **12 Claims**



1. A gyroscope having a gas-turbine reaction rotor which comprises a pair of masses, one spaced from the other at each end of a shaft, and an inner gimbal which extends into the space between the two masses and there provides a rotational mount-

ing for the masses, and means for feeding to the rotor, through the space between the pair of rotor masses, gas to be discharged from the rotor to cause it to spin.

4,690,008

GEARSHIFT RANGE PRECONDITIONING SYSTEM

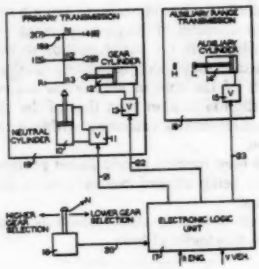
Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 8, 1985, Ser. No. 763,741

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 3429531

Int. Cl.[4] F16H *5/42*

U.S. Cl. 74—336 R 15 Claims



1. A gearshift range preconditioning system for a vehicle transmission having a plurality of neutral gear positions and a plurality of active gear positions comprising:

(a) gear-selecting means manually-operable for generating a gear-change signal indicating a request to change to one of the plurality of neutral and active gears;

(b) electronic control means coupled to said gear-selecting means for receiving such gear-change signal and for receiving vehicle-operating characteristics such as vehicle speed and engine RPMs, said electronic control means further including storage means for storing optimum values of such vehicle-operating characteristics associated with each of the plurality of neutral gear positions, said electronic control means further being effective for generating a neutral control signal representing an optimum neutral gear position as a function of a comparison of such received vehicle-operating characteristics and such optimum values of such vehicle-operating characteristics;

(c) gear-operating means connected to the vehicle transmission and coupled to said electronic control means for receiving such neutral control signal and effecting operation of the vehicle transmission into such optimum neutral gear position in response thereto; and

(d) said gear operating means including a neutral gear cylinder positionable to a plurality of positions proportionally corresponding in number to the plurality of neutral gear positions, and a first solenoid valve coupled to said electronic control means and connected to said neutral gear cylinder such that upon reception of such neutral control signal, said first solenoid valve operates to position said neutral gear cylinder into such optimum neutral gear position.

4,690,009

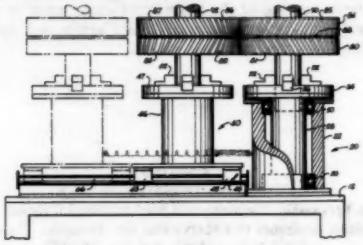
METHOD AND APPARATUS FOR PRODUCING PSEUDO - HERRINGBONE-TYPE GEARS AND GEAR PRODUCED THEREBY

Ajit K. Rakhit, Greer, S.C., assignor to Reliance Electric Company, Greenville, S.C.

Filed Nov. 29, 1985, Ser. No. 802,963

Int. Cl.[4] F16H *55/18*

U.S. Cl. 74—409 24 Claims



1. Apparatus for production of a matched set of shaft-mounted pseudo herringbone gears from preformed helical gears, comprising:

(a) a base;

(b) first chuck means received on said base, said first chuck means defining a shaft receiving bore therein for receiving a first shaft having a first helical gear thereon;

(c) second chuck means received on said base, said second chuck means defining a shaft receiving bore therein extending substantially parallel to said bore in said first chuck means for receiving a second shaft having a second helical gear thereon, at least one of said first and second chuck means being adapted for relative movement with respect to said other of said chuck means while maintaining said shaft receiving bore of said first chuck means substantially parallel to said shaft receiving bore of said second chuck means; and

(d) locking means for locating and securing said first and second chuck means with a predetermined distance therebetween, whereby said first shaft may be received in said shaft receiving bore of said first chuck means and said second shaft may be received in said shaft receiving bore of said second chuck means with the first helical gear of said first shaft substantially meshing with the second helical gear of said second shaft, said first shaft and said second shaft being positioned such that a third helical gear may be provided said first shaft, and a fourth helical gear may be provided said second shaft for substantially meshing with said third helical gear, allowing said first and second helical gears to substantially mesh with one another and said third and fourth helical gears to substantially mesh with one another for producing a matched set of pseudo herringbone gears.

4,690,010

ROBOT ARM DRIVE APPARATUS OF INDUSTRIAL ROBOT

Kazuyuki Matsumoto, Ogaki; Mashataka Hashimoto, and Michiyoshi Iwata, both of Fuwa, all of Japan, assignors to Teijin Seiki Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 817,106, Jan. 8, 1986, abandoned. This application Jul. 29, 1986, Ser. No. 890,971

Claims priority, application Japan, Jan. 18, 1985, 60-7856; Mar. 18, 1985, 60-53866

Int. Cl.[4] B66C *23/00;* F16H *1/28;* H02K *7/02*

U.S. Cl. 74—469 11 Claims

1. A robot arm drive apparatus of an industrial robot comprising:

an electric motor having a drive shaft;

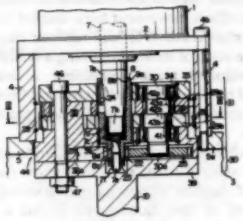
a first robot member having said electric motor mounted thereon;

a second robot member rotatably supported on said first robot member; and

reduction gear means for reducing rotation of said electric motor and then transmitting to said second robot member;

said reduction gear means comprising a primary reduction gear for reducing said rotation of said electric motor and a secondary, planetary reduction gear for further reducing rotation of output of said primary reduction gear;

said electric motor, when in normal operation, having the number of rotations which include the characteristic torsion frequency of a drive system comprising said electric



motor, said second robot member and said reduction gear means;

said primary reduction gear having a reduction ratio so that the maximum number of rotations of said electric motor is reduced less than said characteristic torsion frequency of the drive system;

said secondary reduction gear comprising an eccentric input shaft connected with said primary reduction gear, an external gear which is rotatable eccentrically in response to rotation of said input shaft, an internal gear held in mesh with and larger in number of teeth than said external gear by one, and carrier means held in engagement with said external gear.

4,690,011

SELECTOR MECHANISM FOR AN INFINITELY VARIABLE TRANSMISSION

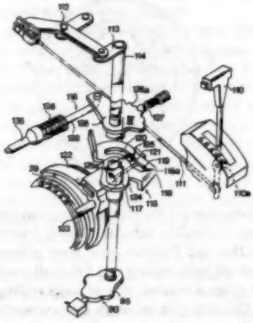
Yasuhito Sakai, Higashimurayama, and Kenichi Yamada, Mitaka, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 693,560

Claims priority, application Japan, Jan. 31, 1984, 59-15411

Int. Cl.[4] B60K *20/12*; F16D *67/02*

U.S. Cl. 74—475 **7 Claims**



1. In a selector mechanism for an infinitely variable belt-drive transmission for a vehicle, the transmission having a selector device comprising a synchronizer for selection of forward and reverse gears, and a hydraulic circuit for changing the transmission ratio of the transmission, the improvement comprising:

a selector lever mounted shiftably along a line so as to perform a selection of ranges including said forward and reverse gears;

a rotatable shaft operatively connected to the selector lever so as to be rotated by the selector lever;

a cam plate secured to the rotatable shaft and having a cam groove including a first arcuate portion and a second arcuate portion which are different in radii, and an intermediate portion between the first and second arcuate portions, the second arcuate portion corresponding to a drive range, and respectively, a high engine speed drive range for downshifting the transmission ratio during driving in the drive range, and the first arcuate portion corresponding to a reverse range and respectively a parking range;

cam follower means following the cam groove for operating the synchronizer; and

a parking lock mechanism including a detent plate secured to the rotatable shaft and having a plurality of indentations, a spring-loaded ball engaging with one of the indentations for holding the rotatable shaft at a selected position, a first cam connected to the detent plate and a locking pawl on a housing of the transmission which are so arranged that when the parking range is selected, the first cam engages the pawl to engage the pawl with a rotatable member of the transmission so as to lock said member;

a second cam secured to the rotatable shaft; and

means actuated by the second cam when the cam plate is rotated into a position corresponding to said high engine speed drive range for causing the hydraulic circuit to provide a high transmission ratio.

4,690,012

ROBOT WRIST

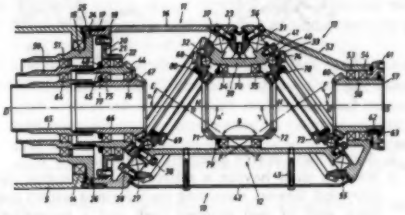
Håkan Dahlquist, and Herbert Kaufmann, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Continuation of Ser. No. 645,686, Aug. 30, 1984, abandoned. This application May 7, 1986, Ser. No. 859,239

Claims priority, application Sweden, Sep. 1, 1983, 8304726

Int. Cl.[4] G25J *17/02*

U.S. Cl. 74—479 **8 Claims**



1. A wrist mechanism which can be attached to the arm of a robot and which can support a working tool, said wrist mechanism comprising

a first tubular wrist part which defines a first central axis therethrough and which has a first end and a second end, said first end being mountable on said robot arm so as to be rotatable about said first central axis and said second end having an oblique orientation relative to said first central axis, said first central axis defining a first rotation axis of said wrist mechanism,

a second tubular wrist part which defines a second central axis therethrough and which has a first end and a second end, each of said first and second ends having an oblique orientation relative to said second central axis,

first journal means for mounting the first end of said second tubular wrist part to the second end of said first tubular wrist part and to enable said second tubular wrist part to rotate relative to said first tubular wrist part about a second rotation axis which intersects said first central axis,

a third tubular wrist part which defines a third central axis therethrough and which has a first end and a second end, said first end having an oblique orientation relative to said third central axis,

second journal means for mounting the first end of said third tubular wrist part to the second end of said second tubular wrist part and to enable said third tubular wrist part to rotate relative to said second tubular wrist part about a third rotation axis which intersects said third central axis,

bevel gear means interconnecting the second end of said first tubular wrist part with the first end of said third tubular wrist part so as to cause coordinated rotation therebetween,

a tool attachment means, and

a third journal means for mounting said tool attachment means on the second end of said third tubular wrist part and to enable said tool attachment means to rotate relative to said third journal means about a fourth rotation axis which intersects said third rotation axis,

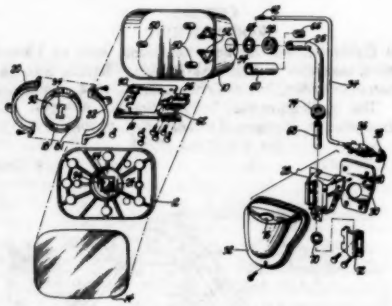
said first, second and third tubular wrist parts allowing a cable to be extended therethrough.

4,690,013

REMOTE CONTROL REAR VIEW MIRROR, CABLE OPERATED

Charles Bramer, Norton Shores, Mich., assignor to Lacks Industries, Inc., Grand Rapids, Mich.

Filed Feb. 13, 1986, Ser. No. 829,004
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501 M **5 Claims**



1. A rear view mirror assembly comprising;

a housing shell having a mirror glass receptive opening provided therein, mounting pads formed within and on a back wall of said housing shell and a mounting plate adapted to be engaged on said pads,

a mirror glass receptive frame part received within the opening in said housing shell and having a spherical surfaced projection on a back side thereof,

a gimbal ring member adapted for gimbal mounting and having the projection on the back side of the mirror glass frame part received in snap-lock spherical engagement therewith,

a pair of retainer rings adapted to be clamped together and to have said gimbal ring member pinned to said rings for movement about a given axis,

said retainer rings and mounting plate being held and retained in said housing shell by the same fastener means,

said gimbal mounted ring member having an inner wall surface thereof formed to complement the spherical form of the back wall projection on said mirror glass frame part and formed to include relief slots to afford the snap-lock engagement aforesaid,

said back wall projection being also formed to include a rearwardly disposed arm having a gear tooth segment provided on an extended end thereof,

said gimbal mounted ring member having a back wall and an opening formed in said back wall receptive of said rearwardly disposed arm and the gear toothed segment therethrough,

means mounted on the back wall of the gimbal mounted ring member and for engagement with the gear toothed segment on said rearwardly disposed arm to effect relative movement therebetween,

remote control means associated with said last mentioned means to effect movement both thereof and of said gimbal ring member relative to said retainer rings, and

said remote control means including a bowden wire and said last mentioned means including a small pinion gear mounted on the end of said wire and between supporting arms formed on the back wall of said gimbal mounted ring member.

2. A rear view mirror assembly, comprising;

a housing shell having a mirror glass receptive opening provided thereon, mounting pads formed within and on a back wall of said housing shell and a mounting plate adapted to be engaged on said pads,

a mirror glass receptive frame part received within the opening in said housing shell and having a spherical surfaced projection on a back side thereof,

a gimbal ring member adapted for gimbal mounting and having the projection on the back side of the mirror glass frame part received in snap-lock spherical engagement therewith,

a pair of retainer rings adapted to be clamped together and to have said gimbal ring member pinned to said rings for movement about a given axis, and

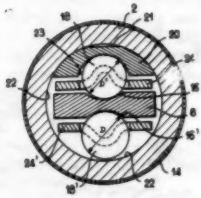
said gimbal mounted ring member having an inner wall surface thereof formed to complement the spherical form of the back wall projection on said mirror glass frame part and formed to include relief slots to afford the snap-lock engagement aforesaid.

4,690,014

FLEXIBLE-TUBE DEVICE FOR TRANSMITTING LONGITUDINAL FORCES

Raymond Richoux, ISPE 40600 Biscarrosse, France

Filed Dec. 5, 1985, Ser. No. 804,785
Claims priority, application France, Dec. 14, 1984, 84 19126
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501 R **7 Claims**



1. A flexible-tube device for transmitting longitudinal forces which comprises a flexible tubular sheath having a circular cross-section, a flat and flexible core strip placed within the sheath, a first row of balls rolling in a first ball-race cut in a first face of the core strip, a second row of balls rolling in a second ball-race cut in the second core-strip face opposite to the first; first and second cage strips for retaining the balls; a single metallic rail having a ball-race groove for the balls only of the first row of balls, said rail being applied against the internal surface of the tubular sheath; wherein the balls of the second row of balls roll directly on the internal surface of said tubular

sheath and wherein said tubular sheath has a smooth internal surface which serves as a ball-race for said balls of said second row of balls; and the ends of said metallic rail being anchored in sleeve means.

4,690,015

POWER TRANSFER DEVICE FOR AUTOMOTIVE VEHICLES

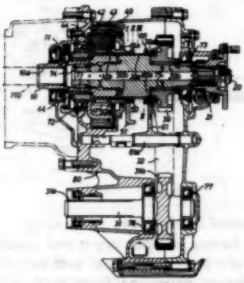
Shuji Nagano; Shuichiro Ida; Toshio Yoshinaka, and Shozo Okuda, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 6, 1985, Ser. No. 805,748

Claims priority, application Japan, Dec. 7, 1984, 59-186353[U]

Int. Cl.[4] F16H *37/06*

U.S. Cl. 74—665 GE **4 Claims**



1. A power transfer device associated with a power transmission for an automotive vehicle, comprising:

an input shaft for connection to an output shaft of said power transmission;

a first output shaft arranged coaxially with said input shaft and rotatably coupled at the inner end thereof with said input shaft;

a second output shaft arranged in parallel with said input and first output shafts;

an output member rotatably mounted on said first output shaft and connectable with said first output shaft, said output member being operatively connected to said second output shaft;

a change-speed mechanism mounted on said input shaft and having an input element connected with said input shaft, a first output element for providing a high speed drive power train, and a second output element for providing a low speed drive power train;

first coupling means mounted on said first output shaft between said change-speed mechanism and said output member and shiftable between a first position where said first coupling means is retained to connect said first output shaft to the first output element of said change-speed mechanism and a second position where said first coupling means is retained to connect said first output shaft to the second output element of said change-speed mechanism;

second coupling means mounted on said first output shaft between said first coupling means and said output member and shiftable between a first position where said second coupling means is retained to connect said output member to said first output shaft and a second position where said second coupling means is retained to disconnect said output member from said first output shaft; and a shift means for shifting said first and second coupling means between their respective first and second positions wherein said first coupling means is arranged to be shifted to and from the second position only when said second coupling means is retained in the first position, while said second coupling means is arranged to be shifted to and from the second position only when said first coupling means is retained in the first position.

4,690,016

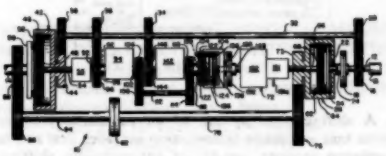
MULTISTATE DIFFERENTIAL TRANSMISSION

Brian Whalen, 8 Hawk Dr., Selden, N.Y. 11784

Filed Jul. 5, 1985, Ser. No. 751,896

Int. Cl.[4] F16H *47/04*

U.S. Cl. 74—687 **10 Claims**



1. A multistate transmission having an input shaft and an output shaft comprising:

a. planetary gear train means having a ring gear, planetary gears with a planetary gear carrier, and a sun gear, said planetary gear train means connected to said output shaft:

b. first bypass means connecting said input shaft to said planetary gear train means;

c. differential transmission means for receiving its input from said input shaft and having means to adjust the torque and speed output infinitely variable over its range of operation for each state of said transmission;

d. power return means for receiving the output of said differential transmission means;

e. means including clutch operated speed reversing means for interconnecting said sun gear in said planetary gear train means with said power return means;

f. said power return means including a first gear to receive the output of said differential transmission means, a second gear connected through said interconnecting means to said sun gear, carrier gear means for interconnecting said first and second gears supported for rotation on a carrier shaft, and means for supporting said carrier shaft for radial rotation;

g. first multispeed transmission means connecting said means for supporting said carrier shaft to said first bypass means whereby the rotational speed of said carrier shaft is determined as a fraction of the speed of said input shaft, whereby an increase in the output speed of said differential transmission means will cause a change in the speed of said sun gear causing said output shaft to increase in speed;

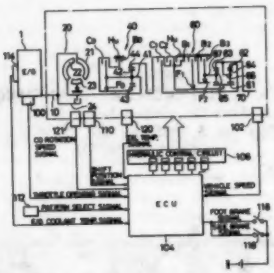
h. means to shift the state of said multistate transmission when the maximum speed of the output shaft is reached for the existing state of said multistate transmission comprising means to unload said first multispeed transmission means and bypass said power return means during shifting of the latter from one speed to another; and

i. means to provide direct coupling between said input shaft and said output shaft through said planetary gear train means while said first multispeed transmission means is shifting from one speed to another.

4,690,017
SHIFT CONTROL SYSTEM OF AUTOMATIC TRANSMISSION

Hiroji Taniguchi; Kunihiro Iwatsuki, and Yoshio Shindou, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 30, 1986, Ser. No. 880,029
Claims priority, application Japan, Jul. 1, 1985, 60-144340; Aug. 20, 1985, 60-182485
Int. Cl.[4] B60K *41/10*
U.S. Cl. 74—866 21 Claims



1. A shift control system of an automatic transmission, wherein said automatic transmission includes first and second transmission sections capable of automatically shifting gear stages independently to thereby achieve multi-stage shifts, said control system comprising:

means for starting a shift in said first transmission section;

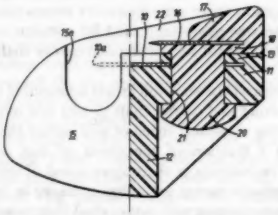
means for starting a shift in said second transmission section at a time after the start of a shift in said first transmission section; and

means for ending the shifts in said first and second transmission sections in synchronism with each other.

4,690,018
RAZOR BLADE ASSEMBLY AND ITS METHOD OF MANUFACTURE

David S. Duncan, London, England, assignor to Wilkinson Sword Limited, High Wycombe, England

Filed Sep. 18, 1985, Ser. No. 777,158
Claims priority, application United Kingdom, Sep. 20, 1984, 8423839
Int. Cl.[4] B21K *21/00*; B26B *21/00*
U.S. Cl. 76—101 R 4 Claims

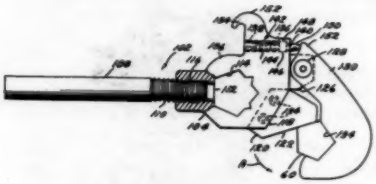


1. A method for the manufacture of a razor blade assembly which comprises forming cutting edges of first and second blades, molding a blade platform and guard bar on to said first blade, molding a top cap on to said second blade, locating the second blade above and parallel spaced from the first blade with the cutting edges of the blades parallel to one another and in mutually staggered relationship, and securing the blades rigidly with respect to one another, which method further comprises molding a blade spacer and rivets on the second blade, the spacer and top cap being formed on opposite sides of the second blade, inserting the rivets in holes provided in the first blade and blade platform and forming heads on the portions of the rivets projecting through said holes.

4,690,019
OPERATING WRENCH FOR TAMPERPROOF HYDRANTS

Joseph L. Daghe; Dennis W. Humes, both of Decatur; Mervin D. Stanley, Stonington, and Gary L. Bouc, Decatur, all of Ill., assignors to Mueller Co., Decatur, Ill.

Continuation-in-part of Ser. No. 736,831, May 22, 1985, Pat. No. 4,554,944. This application Nov. 15, 1985, Ser. No. 798,287
The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.
Int. Cl.[4] B25B *13/28*
U.S. Cl. 81—99 6 Claims



1. A tamperproof fire hydrant comprising:

barrel means having an open upper end portion;

valve means in a lower portion of said barrel means;

valve stem means extending from said valve means upwardly within said barrel means;

a top closure member secured to the upper end section of said barrel means, said top closure member having an aperture therethrough;

a rotatable operating nut operatively connected to said valve stem means for reciprocating the same, said rotatable operating nut having a polygonal end portion projecting out of the aperture of said top closure member;

a tubular hold-down nut carried by said top closure member for positioning said rotatable operating nut against axial movement;

a dome shaped cap covering the polygonal end portion of said operating nut, said cap having a lower edge spaced from said hold-down nut to provide a limited access space to the polygonal end portion of said operating nut;

means supporting said dome shaped cap on said polygonal end portion of said operating nut for relative free rotation with respect thereto; and

operating means for rotating said polygonal end portion of said operating nut in said limited access space between said dome shaped cap and said hold-down nut, said operating means including a handle assembly having a fixed flat jaw part extending from one end of the same, said fixed flat jaw part having a thickness no greater than said limited access space between said dome shape cap member and said hold-down nut and having a straight planar edge surface extending at an acute angle to a longitudinal axis of said handle assembly for engaging at least a substantial portion of one side of said polygonal end portion, said handle assembly further having a flat hook-shaped jaw part pivotally connected thereto adjacent said fixed flat jaw part and projecting axially of the same, said pivotal flat hook-shaped jaw part having cooperating edge surfaces facing generally toward said planar edge surface of said fixed flat jaw part for engaging at least a portion of three other sides of said polygonal end portion of said operating nut, said pivotal flat hook-shaped jaw part having a thickness no greater than said limited access space between said dome shaped cap member and said hold-

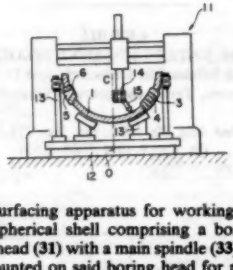
down nut, and spring means carried by said handle jaw part to normally urge said cooperating surfaces of the said pivotal flat hook-shaped jaw part toward said straight planar surface of said fixed jaw part when rotating said operating nut, said pivotal jaw and said fixed jaw thereby squeezing said end portion tightly without restraint, said spring means permitting said pivotal flat hook-shaped jaw part to be pivoted away from said polygonal end portion when said operating means is being removed.

4,690,020

APPARATUS FOR WORKING PERIPHERAL WALL OF HEMISPHERICAL SHELL

Ryoichiro Sasano; Tsutomu Toyohara, and Toshimichi Takigawa, all of Kobe, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Division of Ser. No. 593,628, Mar. 26, 1984, Pat. No. 4,617,845. This application Jul. 2, 1986, Ser. No. 881,064
Claims priority, application Japan, Mar. 29, 1983, 58-51574
Int. Cl.[4] B23B *3/28, 5/40*
U.S. Cl. 82—2 D **2 Claims**



1. A profile surfacing apparatus for working a peripheral wall of a hemispherical shell comprising a boring machine having a boring head (**31**) with a main spindle (**33**), and apparatus body (A) mounted on said boring head for receiving said main spindle, a rotary flange (**50**) rotatably supported on said apparatus body and connected to said main spindle for receiving a rotary drive force of said main spindle, said rotary flange having a rotation axis, a rotary arm (**60**) provided on an end of said rotary flange and having a slide guide portion (**60*a*, 60*b***) extending in a direction perpendicular to the rotation axis of said rotary flange, a template (**92**) fixed to said rotary arm and extending along said slide guide portion, a slide head (**78**) slidable along said slide guide portion of said rotary arm, a cutting tool holder (**84**) provided with a cutting tool (**85**) and mounted on said slide head for movement parallel to the rotation axis of said rotary flange in cutting and feeding directions, and a profiling unit engaged with said template and connected to said tool for moving said cutting tool in the cutting and feeding directions along said template which is mounted on said rotary arm for profiling the semispherical shell.

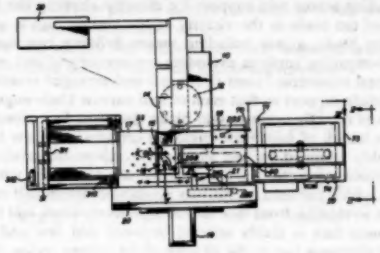
4,690,021

AUTOMATIC LOAD UNLOAD TURRET PUNCH

Stephen C. Clark, Clemson, S.C., assignor to Strippit/Di-Acro-Houdaille, Inc., Akron, N.Y.

Continuation of Ser. No. 52,241, Jun. 26, 1979, abandoned, which is a continuation of Ser. No. 815,821, Jul. 15, 1977, abandoned. This application Sep. 20, 1985, Ser. No. 777,872
Int. Cl.[4] B21D *43/11, 43/22, 43/24*
U.S. Cl. 83—71 **18 Claims**

1. A machine tool device comprising, in combination: an automatic control device, a machine tool, a worktable adjacent the machine tool, a workpiece loading device adjacent the worktable having carriage means for moving a workpiece from a supply spaced from the worktable to a loading portion of the worktable and depositing it thereon, a workpiece grasping and moving device associated with the worktable for moving a workpiece on the worktable, means for gauging a workpiece deposited on the loading portion including sensing means sensing engagement of the deposited workpiece with devices having positions on the worktable which is known by the control device at the time of gauging, at least one of said devices being movable under control of said controller to a known position, said means for gauging including moving means causing relative movement between the workpiece and the sensing means to cause said engagement, actuation of the sensing means providing an input to the automatic control device indicating positioning of portions of the workpiece at



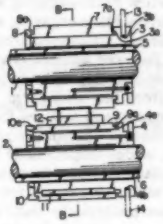
the known positions, the machine tool, loading device, workpiece grasping and moving device and moving means all being under the control of the control device.

4,690,022

STAMPING DEVICE HAVING IDENTICAL MOUNT BASES FOR ROTATABLY SUPPORTING A CUTTING TOOL AND AN ANVIL

Takehiro Takahashi, Mihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1985, Ser. No. 753,965
Int. Cl.[4] B26D *1/36;* B31B *1/24*
U.S. Cl. 83—308 **7 Claims**



1. A stamping device for cutting holes in paper sheet such as corrugated cardboard, comprising:

a pair of identically shaped mount bases, each of which is slidably mounted on a respective rotatable upper and lower shaft, each of said mount bases having the same dimensions and being of one-piece cylindrical construction and fixed to said respective shaft for rotation therewith, each of said mount bases having means thereon for adjusting the position of said mount bases along said respective shaft;

an anvil and a knife base both of which are interchangeably mounted on said mount bases;

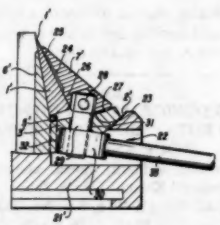
said anvil slidably disposed on one of said mount bases, said anvil being freely rotatable with respect to said one mount base;

said knife base slidably disposed on the other of said mount bases, means fixing said knife base to said other mount base for rotation therewith, said knife base having a cutting tool disposed thereon; and

a pair of identically shaped retaining plates, each of said retaining plates being fixed to a respective one of said mount bases, one of said retaining plates engaging said anvil for positioning said freely rotatable anvil on said one of said mount bases, the other of said retaining plates engaging said knife base for positioning said knife base on said other mount base.

2. The stamping device of claim 1, wherein said means fixing said knife base to said other mount base comprises a key which is fitted in respective slots in said knife base and said other mount base.

faces in condition for cutting wherein a cutting operation with the blade is effected by a cutting region of the cutting blade, which mechanism comprises, a base, a blade support mounted on said base defining a generally planar blade abutment face extending across said support for directly abutting the front face of the blade in the vicinity of the cutting region of the cutting blade, a jaw including means defining two narrow blade-engaging surfaces extending transversely of and across the total transverse extent of the jaw and arranged relative to said blade support so that each of said narrow blade-engaging surfaces directly opposes said blade abutment face along the entire length of said blade-engaging surfaces, said jaw being movably mounted on said support for movement relative to said blade abutment face between one jaw position at which a blade which has been operatively positioned within said mechanism so that the front face therof operatively abuts said blade abutment face is stably secured between said jaw and said blade abutment face in the vicinity of the cutting region of the



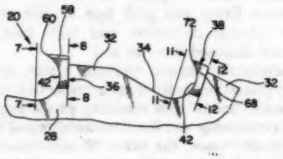
blade as said two narrow blade-engaging surfaces of the jaw and only said two narrow blade-engaging surfaces engage the back face of the blade and effectively press the blade against said blade abutment face and another jaw position at which said two narrow blade-engaging surfaces are in condition for releasing the blade from the mechanism, and means acting between said blade support and said jaw for releasably urging said jaw from said another jaw position to said one jaw position so that when a rigid, wedge-shaped blade is operatively positioned between said blade abutment face and said jaw and said jaw is said urged by said urging means from said another jaw position to said one jaw position, the blade is securely clamped in the vicinity of the cutting region of the cutting blade used for cutting and so that movement of said jaw from said one position to said another position permits the blade to be shifted relative to and across said support for operatively positioning an alternative cutting region of the cutting blade between said jaw and said abutment face thereby permitting substantially all of the blade to be used.

4,690,024

SAW BLADE AND TIP THEREFOR

Peter C. Chaconas, Glyndon, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 28, 1985, Ser. No. 706,523
Int. Cl.[4] B27B *33/08, 33/12*
U.S. Cl. 83—852 **45 Claims**



1. A tip for a saw blade having a gullet formed integrally with the blade, which comprises:

a one-piece tip body for assembly with the saw blade immediately adjacent the integrally formed gullet;

the tip body being composed of a hardened long-wearing material;

a front face formed on the tip body extending from a first-end edge of the front face to a second-end edge thereof;

a top face formed on the tip body;

a first side and a second side formed on the tip body on opposite sides of the front face and contiguous therewith;

the front face and the top face being contiguous along a common edge coincidental with the first-end edge of the front face and which extends from the first side of the tip body toward a second side of the tip body;

the front face being formed with a curved surface contiguous with the common edge and extending from the common edge over the entire front face to the second-end edge thereof which is positionable adjacent the gullet integrally formed with the saw blade; and

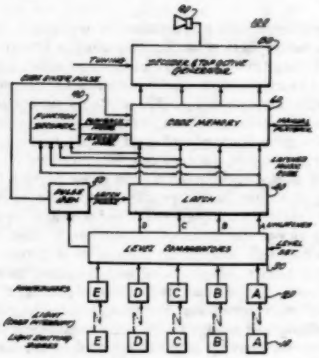
a cutting edge formed by the portion of the common edge which extends from a the first side of the tip body toward the second side of the tip body.

4,690,025

MUSICAL ENTERTAINMENT BOARD GAME

Robin H. Hines; Michael R. Glasscock, and D. Bruce Johnson, all of Tullahoma, Tenn., assignors to Quantime, Inc., Tullahoma, Tenn.

Filed Aug. 30, 1985, Ser. No. 771,024
Int. Cl.[4] G10H *3/06, 5/00*
U.S. Cl. 84—1.18 **4 Claims**



1. An apparatus for reproducing a portion of a melody so that individuals can attempt to identify the title of the melody after listening to said portion of said melody, said apparatus comprising:

melody encoding means comprising a card having a plurality of holes in a predetermined pattern, said predetermined pattern of holes representing the muscial notes of said portion of melody to be reproduced;

a set of light emitting diodes;

a set of photodiodes facing said set of light emitting diodes, wherein said card is inserted between said set of light emitting diodes and said set of photodiodes so that said predetermined pattern of holes determines a predetermined sequence in which said photodiodes will receive light from said light emitting diodes and photodiodes to thereby generate said signals;

comparator means for comparing signals output from a portion of said set of photodiodes to a predetermined input signal level to determine which ones of said portion of said set of photodiodes are at a high signal level and which ones of said portion of said set of photodiodes are at a low signal level;

latching means for latching said high and low signals received from said comparator means in response to an input latching signal generated in accordance with at least one photodiode, other than said portion of said set photodiodes, going to a high signal level; and

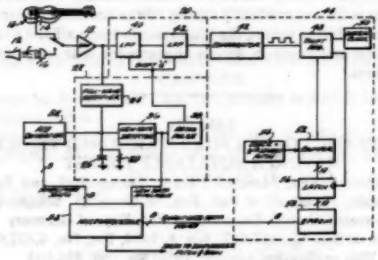
converter means for converting said signals determined by said predetermined sequence in which said photodiodes receive light from said light emitting diodes into said musical notes of said portion of said melody to be reproduced.

4,690,026

PITCH AND AMPLITUDE CALCULATOR AND CONVERTER WHICH PROVIDES AN OUTPUT SIGNAL WITH A NORMALIZED FREQUENCY

Bing McCoy, #8 Carderock Ct., Bethesda, Md. 20817, assignor to Bing McCoy, Bethesda, Md. and Donald DeLaski, Great Falls, Va.

Filed Aug. 22, 1985, Ser. No. 768,447
Int. Cl.[4] G10H *1/12, 3/02, 7/00*
U.S. Cl. 84—1.19 **25 Claims**



1. A system for determining a standard quantized fundamental frequency of a periodic signal from a musical instrument, comprising:

means for detecting said periodic signal and providing a detect signal indicative thereof;

threshold means for determining when said detect signal exceeds a predetermined threshold;

counter means for counting the number of times said threshold is exceeded in a determinable time period and providing a count indicative thereof;

memory means for storing a plurality of quantized fundamental frequencies at predetermined addressable locations, said quantized frequencies representing a standard frequency to which all frequencies within a predetermined range are normalized; and

means for addressing said memory means based on said count and reading the quantized fundamental frequency stored thereat.

4,690,027

APPARATUS FOR FINE TUNING STRINGS OF A STRINGED MUSICAL INSTRUMENT

Nobuyuki Ido, 910-1, Osugi, Seki-shi, Gifu-ken, Japan

Filed Mar. 26, 1986, Ser. No. 844,402
Int. Cl.[4] G10D *3/04*
U.S. Cl. 84—298 **3 Claims**

1. An apparatus for fine tuning a plurality of strings of a stringed musical instrument, comprising:

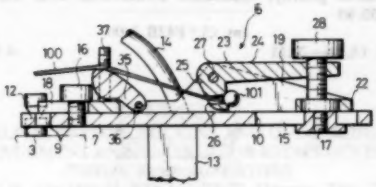
(a) a base plate adapted to be attached to a body of the stringed musical instrument;

(b) a plurality of saddle plates mounted on said base plate;

(c) a string anchoring member on each said saddle plate, each said anchoring member having an arm pivotable toward and away from said base plate and a hook extending from said arm and adapted to catch a terminal ball disposed on a rear end of a respective string, said hook being pivotable longitudinally of the respective string in response to pivotal movement of said arm;

(d) first adjusting means mounted on said arm of each said anchoring member for adjusting a distance between said arm and said base plate to change the position of said hook to fine tune the respective string;

(e) first and second side walls respectively disposed at first and second sides of each said anchoring member;



(f) a saddle mounted separately on each of said saddle plates in front of said anchoring member, said saddle having a base portion and having opposite first and second side portions with a groove formed therebetween for receiving a respective string; and

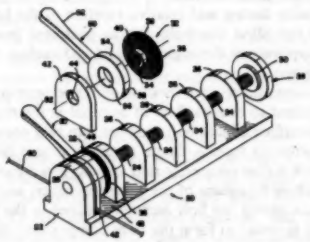
(g) a pin provided on each of said first and second side walls for supporting said base portion of said saddle for pivoting said saddle on said saddle plate toward and away from said base plate.

4,690,028

STRING CLAMPING DEVICE

Ned Steinberger, Cornwall, N.Y., assignor to Steinberger Sound Corporation, Newburgh, N.Y.

Filed Apr. 18, 1986, Ser. No. 853,670
Int. Cl.[4] G10D *3/12*
U.S. Cl. 84—314 N **15 Claims**



1. A clamping device for clamping the strings of a stringed musical instrument comprising:

a base, the base including a plurality of threaded shank elements, and a plurality of spaced stationary clamping plates forming an array extending across and spaced between the strings of the musical instrument when positioned on the musical instrument;

a plurality of threaded nuts, each threaded on a respective shank element; and

a plurality of actuation means, each interposed between a respective threaded nut and stationary clamping plate for selectively applying clamping pressure to a string positioned between a respective actuation means and stationary clamping plate by engaging and rotating with a respective threaded nut as clamping pressure is applied to the string.

4,690,029

METHOD OF SECURING A FLARE COMPOSITION SLEEVE IN A BLIND BOREHOLE AT THE TAIL PORTION OF A PROJECTILE BODY

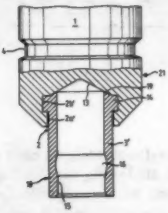
Harald Katzmann, Neuenhof; Werner Senn, Zurich, and David Ammann, Gossau, all of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Dec. 9, 1986, Ser. No. 939,860

Claims priority, application Switzerland, Dec. 16, 1985, 05353/85

Int. Cl.[4] F42B *3/00*

U.S. Cl. 86—20.11 **4 Claims**



1. A method of securing a flare composition sleeve in a blind borehole at the tail portion of a projectile body, comprising the steps of:

forming at the tail portion of the projectile body a blind borehole having an annular groove located at a predetermined region of the blind borehole;

providing a bolt member from which there is to be formed said flare composition sleeve;

inserting said bolt member into said blind borehole until an end surface thereof abuts against a bottom portion of said blind borehole;

rotating said bolt member and said projectile body containing the blind borehole relative to one another while exerting pressure between the relatively rotating bolt member and the projectile body conforming the blind borehole to produce frictional heat;

generating during said relative rotation of the bolt member and the blind borehole due to frictional heat a rise in temperature at the region of said end surface of said bolt member;

continuing said relative rotation until said temperature rise is sufficient to cause a flow of material at the region of said end surface of said bolt member into said annular groove in order to form a flange member at said bolt member which is thus secured in said annular groove and the blind borehole by means of the flange member; and

then machining the bolt member secured in the blind borehole in order to form the flare composition sleeve.

4,690,030

MINE FIELD CLEARING APPARATUS

Simcha Bar-Nefy, Omer, and Michael Tiomkin, Beersheva, both of Israel, assignors to Israel Aircraft Industries Ltd., Ben Gurion Airport, Israel

Continuation-in-part of Ser. No. 554,639, Nov. 23, 1983, Pat. No. 4,590,844. This application Sep. 24, 1984, Ser. No. 653,835

Claims priority, application Israel, Sep. 25, 1983, 69802

The portion of the term of this patent subsequent to Jan. 1, 2002, has been disclaimed.

Int. Cl.[4] F41F *3/02*

U.S. Cl. 89—1.13 **15 Claims**

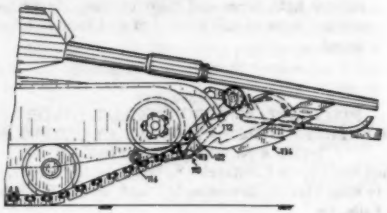
1. Mine clearing apparatus for attachment to a vehicle and comprising:

a frame mountable onto a vehicle for selectable positioning in a raised or lowered orientation;

means, mounted onto said frame, for raising and shunting aside mines to a location removed from the path of said vehicle;

means for selectably retaining said frame in a raised orientation; and

electrically operated means operable from inside the vehicle for automatically raising said frame and said raising and



shunting means from a lowered orientation to a raised orientation independently of vehicle motion, wherein said means for automatically raising comprises motor means as well as lifting means, the lifting means being affixed to said frame and being in driven engagement with said motor means.

4,690,031

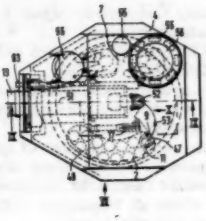
AUTOMATIC LOADER FOR AN ARMORED VEHICLE HAVING A ROTATABLE TURRET

Josef Metz, Neuss; Manfred Pehker, Duesseldorf, and Erich Zielinski, Haan, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Division of Ser. No. 617,677, Jun. 5, 1984, Pat. No. 4,632,011. This application Apr. 28, 1986, Ser. No. 856,503

Int. Cl.[4] F41F *9/10*

U.S. Cl. 89—36.13 **4 Claims**



1. In an armored vehicle, said vehicle having a rotatable turret which has an uppermost region visible from the outside, an improved automatic loader for transporting projectiles, said projectiles being vertically stored in said vehicle and being movable from an endless band automatically driven magazine which extends into said uppermost region to a position in the loading chamber of a large caliber weapon from which it is slid into the gun barrel of the weapon by means of rammer means, the improvement comprising

(a) said endless band automatically driven magazine being operatively mounted in said uppermost region in a trough portion of the armored vehicle which is disposed immediately below said uppermost region of the rotatable turret and on one side of the longitudinal axis of the gun barrel, encircled by a partition wall, said armored vehicle also including a personnel chamber which is separated from said uppermost region and trough of said armored vehicle and is located on the other side of the lognitudinal axis of the gun barrel;

(b) a plurality of projectiles being stored in said magazine in a first vertical position, feeding means being operatively

mounted in said armored vehicle for successively grasping projectiles stored in said magazine in said first position and transporting them by means of a pivotal movement into a second loading position in said loading chamber; said feeding means being pivotally mounted in said armored vehicle about a horizontal shaft and located between the longitudinal axis of the gun barrel and the magazine;

and first driving means operatively connected to said feeding means for pivoting them about said horizontal shaft;

(c) loading tray means operatively mounted in said armored vehicle, said feeding means operatively connected to said loading tray means ;

(d) said loading tray means being movable by said first driving means via said feed means by being swung upwardly toward the turret, and

(e) said loading tray means being movable from a first vertical upright position in which position projectiles are stored through a first arc in which said tray remains normal to a first plane to an intermediate position and through a second arc in a second plane to a loading position, said first and second planes being normal to each other and said loading position being disposed in axial alignment with the gun barrel.

4,690,032

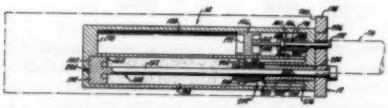
BREECH/RECEIVER ASSEMBLY FOR AUTOMATIC CANNONS

Eugene M. Stoner, Palm City, Fla., assignor to ARES, Inc., Port Clinton, Ohio

Continuation of Ser. No. 559,304, Dec. 8, 1983, Pat. No. 4,599,933. This application Mar. 11, 1986, Ser. No. 838,590

Int. Cl.[4] F41F *19/14*

U.S. Cl. 89—43.01 **9 Claims**



1. A breech/receiver assembly for automatic cannon having a barrel comprising;

a receiver having trunion means for pivotally supporting the receiver in a a gun mount,

a breech having means defining a first aperture therein for receiving a chamber and a second aperture therein, communicating with said first aperture and adapted for receiving the barrel at an outside end thereof, said breech being slidably mounted within the receiver;

a chamber having means defining an opening therethrough sized for accepting ammunition, said chamber being mounted within the breech first aperture for rotational movement about a chamber axis from a first position in which the opening therein is aligned with the breech second aperture and barrel and a second position in which the opening therein is disposed at an angle with said breech second aperture and is aligned for simultaneously accepting ammunition from a point outside the breech and ejecting ammunition casings therefrom, said chamber axis being coaxial with said trunion means when the chamber aperture is aligned with the breech first aperture and the breech is in battery position; and,

combination recoil and counterrecoil buffer means disposed within said breech for buffering barrel recoil and counterrecoil forces as the breech slides within the receiver, said combination recoil and counterrecoil buffer means including two fixed pistons and means defining first and second longitudinal chambers in said breech for receiving said fixed pistons, one piston being disposed in each of said first and second longitudinal chambers, said longitudinal chambers being disposed on opposite sides of said breech first aperture and having axes generally parallel with one another and with the breech second aperture longitudinal axis, said fixed pistons being fixed to the receiver and moving in said longitudinal chambers in the breech when the breech moves relative to the receiver in recoil and counterrecoil.

4,690,033

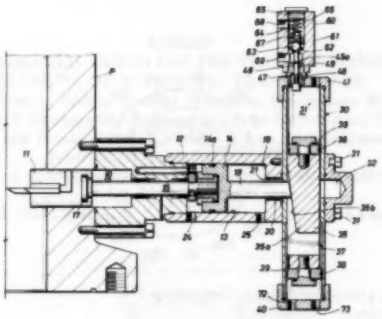
SELF ACTUATING LOCKING AND UNLOCKING ARRANGEMENT AND METHOD FOR RECIPROCATING PISTON TYPE ACTUATORS

Denzal W. Van Winkle, P.O. Box 79727, Houston, Tex. 77279

Filed Dec. 16, 1985, Ser. No. 807,735

Int. Cl.[4] F15B *15/26*

U.S. Cl. 91—43 **4 Claims**



1. In a fluid actuator having a cylinder with a piston reciprocable therein between alternate positions by actuating fluid, the invention including:

a rod on the piston extending through one end of the cylinder for connection with a part to be moved, and a tail rod on the piston having an outer end extending through the opposite end of the cylinder;

a body;

a lock member in said body, said lock member having a wedge shaped portion reciprocable between a first position in which said lock member wedge shaped portion is disposed to one side of the tail rod, when said piston is moved to one of its alternate positions, and a second position in which said lock member wedge shaped portion is disposed across the outer end of the tail rod, as said piston is moved toward its other alternate position;

means for simultaneously communicating actuating fluid to the cylinder and to said lock member which maintains said lock member wedge shaped portion and the tail rod outer end in locking relation as the piston moves to and is in the other alternate position;

means including passage means and normally closed valve means therein for controlling communication of actuating fluid to the cylinder for moving the piston to the one alternate position;

means for communicating actuating fluid to said lock member for moving said lock member to the first position; and

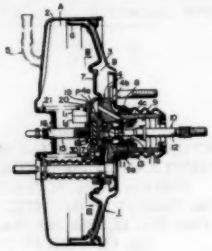
means operable by said lock member when it is moved to said first position to open said valve means and communicate actuating fluid to the cylinder to move the piston to the one alternate position.

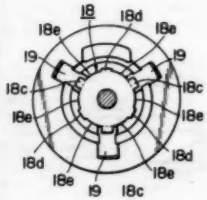
4,690,034

PNEUMATIC BOOSTER

Hiromi Ando, Tokyo; Mitsuhiro Endo, Kanagawa, and Yukou Ono, Tokyo, all of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Mar. 18, 1985, Ser. No. 713,030
Claims priority, application Japan, Mar. 19, 1984, 59-52844
Int. Cl.[4] F15B 9/10
U.S. Cl. 91—369 A 7 Claims





1. A pneumatic booster comprising:

a housing;

a diaphragm and a power piston coacting to divide the interior of said housing into a constant-pressure front chamber and a variable-pressure rear chamber;

a valve mechanism positioned in said power piston for controlling the pressure in said rear chamber;

an input shaft connected to said valve mechanism for actuating said valve mechanism;

an output shaft in said front chamber for transmitting an output force from said power piston, said output shaft having at least one abutting portion adjacent a rear end thereof, said abutting portion extending radially outward from said output shaft;

a reaction disc mounted on said power piston on a side of said power piston facing said front chamber, said reaction disc contacting with the rear end of said output shaft in transmitting the output force from said power piston to said output shaft;

a return spring in said front chamber for biasing said power piston towards said rear chamber;

a plurality of angularly spaced and radially extending reaction levers having radially inner ends thereof abutting with a rear surface of said abutting portion of said output shaft, lengthwise intermediate portions of said reaction levers engagaing with said power piston at fulcrum points on said power piston and radially outer ends of said reaction levers engaging with said return spring, said reaction levers being operable to transmit at least part of the output force from said power piston to said output shaft, said reaction levers transmitting at least part of a reaction force from said output shaft to said input shaft and sasid reaction levers balancing at least part of the reaction force applied to the output shaft with the force of said return spring to thereby prevent at least part of the reaction force from being transmitted to said reaction disc; and

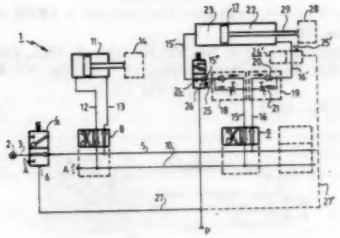
means for rotating said output shaft to control the point of engagement between said reaction levers and the abutting portion of said output shaft to thereby vary the amount of force transmitted from said power piston to said output shaft.

4,690,035

EMERGENCY DRAINING DEVICE FOR STOPPING PNEUMATIC CYLINDERS

Daniel Bouteille, Ville d'Avray; Michel Nicolas, Neauphle le Chateau, and Daniel Guillin, Sannois, all of France, assignors to La Telemecanique Electrique, France

Continuction of Ser. No. 686,510, Dec. 26, 1984, abandoned.
This application Sep. 29, 1986, Ser. No. 912,700
Claims priority, application France, Jan. 17, 1984, 84 00652
Int. Cl.[4] F01B 3/00
U.S. Cl. 91—442 3 Claims



1. The combination of a pneumatic cylinder having at least one working chamber formed in a cylindrical body and control means for effecting supply and release of fluid under pressure selectively to and from said working chamber, said control means comprising:

pneumatic distributor means having a power inlet connected to a source of fluid pressure, an outlet and a control inlet connected to a control pneumatic conduit adapted to transmit a control signal of pressure;

an emergency drain device having a pressurized fluid supply inlet, a fluid outlet, means for connecting the said fluid outlet to said working chamber, a control chamber having control inlet means, an internal chamber permanently connected to the supply inlet and to the fluid outlet and having a by-pass channel portion in controllable communication with an exhaust connected to the atmosphere and a valve member movable in said control chamber, said valve member being actuated by said control signal of pressure and cooperating with said by-pass channel portion for controlling the said communication;

means connecting the outlet of the pneumatic distributor means to the pressurized fluid inlet of said emergency drain device, and

conduit means connecting said control inlet means of said emergency drain device to said pneumatic control conduit, said valve member being pushed by said control signal of pressure in a first position in which said communication is closed and being pushed in a second position by a transitory pressure which remains in said internal chamber when the control signal of pressure in the control pneumatic conduit is cancelled.

4,690,036

AXIAL PISTON PUMP OR MOTOR WITH MULTI POSITION SWASH PLATE

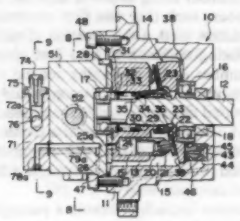
Masato Kosaka, Tokyo, and Tatsu Yamazaki, Yamato, both of Japan, assignors to Kayaba Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 689,652, Jan. 8, 1985, abandoned. This application Feb. 28, 1986, Ser. No. 838,421

Claims priority, application Japan, Aug. 16, 1984, 59-170728

Int. Cl.[4] F01B *13/04*

U.S. Cl. 91—506 **6 Claims**



1. A hydraulic pump or motor comprising a casing having a cavity therein with an inside face, a rotary shaft pivotally mounted to said casing for rotation in said cavity, said shaft having a rotation axis and said inside face of said casing extending perpendicularly to said rotation axis, a cylinder block connected to said rotary shaft for rotation therewith in said cavity, said cylinder block having a plurality of cylinders, a plunger slidably inserted into each of said cylinders of said cylinder block, a pair of kidney shaped ports extending in said casing and communicating with said cavity, one of said kidney shaped ports forming a low pressure side port and the other of said kidney shaped ports forming a high pressure side port, said cylinder block being engaged with said pair of kidney shaped ports and said ports communicating respectively with said cylinders as said cylinder block rotates with rotation of said rotary shaft, a sliding shoe connected to each plunger, and a swash plate disposed in said cavity and having a smooth slant surface on which each shoe of each plunger is slidably engaged, for transmitting a resultant force at a working point on said swash plate, said swash plate having first and second abutting planes on a side opposite from said slant surface, said planes lying in mutually different angles and meeting each other at a border line, said swash plate being non-rotatably and pivotally mounted in said cavity and having two pivotal positions, one position with one of said planes in engagement with said inside face of said casing and the other position with the other of said planes engaged with said inside face with the other of said planes engaged with said inside face of said casing, sais swash plate having a pair of semicircular recesses lying on said border line and defined in said planes on opposite sides of said shaft, said casing having a pair of semicircular recesses in said inside face aligned respectively with said pair of semicircular recesses of said swash plate, a ball positioned in each of said pair of aligned recesses for pivoting of said swash plate between its positions, said border line engaged against said inside face of said casing to form a fulcrum for pivoting of said swash plate, a pair of drive cylinders with drive pistons therein, arranged in said casing on opposite sides of and at equal distances from a dividing plane containing said rotation axis for said rotary shaft and extending perpendicular to said border line, each ball in said aligned semicircular recesses lying on opposite sides of said dividing plane, said casing having passages therein for communicating each drive cylinder with one of said pair of kidney shaped ports which is located on the same side of said dividing plane as said drive cylinder, said drive cylinders being positioned eccentrically with respect to said rotation axis and said swash plate, and each drive piston being engaged against one of said abutting planes at pressure points with said working point being between said fulcrum and said pressure points and whereby low pressure is exerted on one of said drive cylinders and on cylinders of said cylinder block which are in communication with said low pressure side port and, high pressure is exerted on said drive cylinder and said cylinders of said cylinder block which are in communication with said high pressure side port to compensate forces exerted on opposite sides of said swash plate.

4,690,037

HYDRAULIC SERVO FOR FRICTION COUPLING ELEMENT OF AUTOMATIC TRANSMISSION

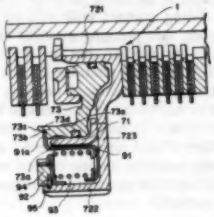
Koji Sumiya, Nishio; Kazuaki Watanabe, and Seitoku Kubo, both of Toyota, all of Japan, assignors to Aisin-Warner Limited and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Jul. 29, 1985, Ser. No. 759,827

Claims priority, application Japan, Jul. 31, 1984, 59-161905

Int. Cl.[4] F01B *31/00*

U.S. Cl. 92—130 R **5 Claims**



1. A hydraulic servo for a friction coupling element in an automatic transmission including a casing, comprising:

an annular drum fixed to the automatic transmission casing and having an outer cylinder, asn inner cylinder, a sidewall connecting said outer and inner cylinders, and an intermediate cylinder connected to the sidewall between the outer and inner cylinders to divide the interior of said drum into outer and inner annular spaces;

a piston slidably mounted within said outer annular space, between the outer and intermediate cylinders, said piston having a terminal axially extending guide sleeve portion; and

return biasing means including:

a connecting member having one end fixed to said piston and abutting said guide sleeve portion and the other end located in said inner annulasr space, between the inner cylinder and the intermediate cylinder;

a retainer fixed to the inner cylinder, at a position axially inward of said guide sleeve with respect to said sidewall when said piston is fully retracted, and;

return springs interposed within said inner annular space between said other end of said connecting member and said retainer.

4,690,038

HYDRAULICALLY ACTUATED PISTON MACHINE WITH BEARING FOR CONNECTING PISTON TO PISTON ROD

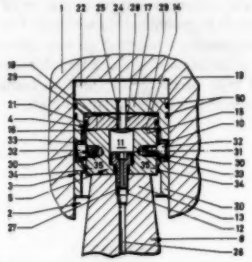
Jürgen Klie, and Rudolf Beyer, both of Sprockhövel, Fed. Rep. of Germany, assignors to G. Dusterloh, GmbH, Sprockhövel, Fed. Rep. of Germany

Filed Jan. 9, 1986, Ser. No. 817,358

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1985, 3500451

Int. Cl.[4] F01B 31/00; F16J 1/14, 1/04

U.S. Cl. 92—181 R 19 Claims



1. A piston machine, particularly a hydraulically-actuated piston machine, comprising at least one cylinder having an axis; a piston axially slidable in said cylinder and having a piston bottom with an inner surface; a piston rod turnably connected with said piston and having a piston rod shaft; a turning member mounted on said piston rod and having a side which is opposite to said piston rod shaft and has a convex circular surface; a pressing member having a shell surface which is in sliding contact with said circular surface of said turning member, said pressing member having a side which is opposite to said turning member and is provided with a convex circular surface movably abutting against said inner surface of said piston bottom so that said pressing member is movable both relative to said turning member and to said piston bottom, said circular surface of said pressing member and one of said circular surface of said turning member and said shell surface of said pressing member having central axes with central axes projections along their common orthogonals forming an angle of approximately 90°.

4,690,039

AIR CONDITIONER FOR VEHICLE

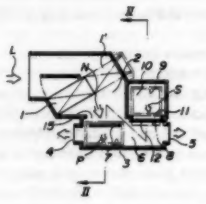
Goro Uchida, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 761,664, Aug. 1, 1985, abandoned, which is a continuation of Ser. No. 557,924, Dec. 5, 1983, abandoned. This application Dec. 1, 1986, Ser. No. 936,985

Claims priority, application Japan, Feb. 8, 1983, 58-17218

Int. Cl.[4] B60H 1/24

U.S. Cl. 98—2.08 10 Claims



1. An air conditioner for a vehicle, comprising:

three chambers in series communication, a first chamber having an air inlet and a heat exchanger, a second chamber communicating with a downstream portion of said first chamber and having at least one mid-level directed ventilation diffuser, and a third chamber communicating with a downstream portion of said second chamber and having at least one downwardly directed heater diffuser and at least one upwardly directed defroster diffuser;

said first and third chambers being disposed adjacent to each other on opposite sides of a shared first common wall;

said second chamber being disposed adjacent to said first and third chambers such that said first common wall abuts a second common wall, a first portion of said second common wall being common to said first chamber and said second chamber and a remaining second portion of said second common wall being common to said third chamber and said second chamber, said first and second portions of said second common wall lying in a common plane;

said downstream portion of said first chamber communicating with said second chamber through a first opening in said second common wall;

said first chamber including therein a passage for directing air through said heat exchanger and a bypass for bypassing said heat exchanger to direct air from said inlet to said first opening, an air mix damper being located upstream of said heat exchanger for selectively controlling the relative amounts of air flowing through said passage and bypass of said first chamber;

said downstream portion of said second chamber communicating with said third chamber through a second opening in said second common wall, a switching damper being located within said second opening for selectively controlling communication between said second and third chambers.

4,690,040

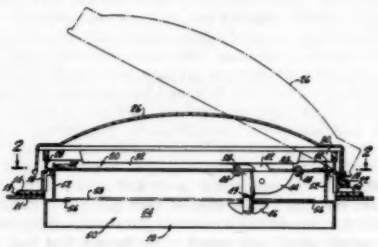
SNAP-IN SCREEN FRAME AND MOUNTING FOR SAME

Timothy J. Barnett, Anaheim, Calif., assignor to Elixir Industries, Gardena, Calif.

Filed May 27, 1986, Ser. No. 866,707

Int. Cl.[4] B60H 1/26

U.S. Cl. 98—2.14 23 Claims



1. A screen frame attaching apparatus for attaching a screen frame into a ventilation opening housing having a support bar extending between first and second opposing side walls of the ventilation opening housing corresponding to first and second opposing side walls of the screen frame, comprising:

a first and a second pawl arm each connected to a respective one of the screen frame first and second side walls, and extending above a rim defining the terminus of the respective side wall of the screen frame, each pawl arm having a first surface and an opposing second surface;

a pawl extending from the respective first surface outwardly beyond the plane of the first surface;

a first and second pawl receiving opening positioned at opposing ends of the support bar and shaped and positioned to receive a respective one of the pawls, and such that movement of the respective pawl into the respective

pawl opening deflects the respective pawl arm resulting in the respective pawl snapping into a mated position when the respective pawl clears the respective pawl opening; and

cooperating means on the opposing second surface of the pawl arm for cooperating with the pawl opening for restraining lateral deflection of the pawl arm from its mated position, to thereby hold the pawl arm in its mated position.

4,690,041

PREVENTION, ARRESTING AND REMOVAL OF ACCUMULATION OF MOISTURE IN BUNKER STORAGES

Henry J. Banks, Pialligo, and John R. Wiseman, via Hall, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australia

Filed Mar. 19, 1986, Ser. No. 841,418
Claims priority, application Australia, Mar. 19, 1985, PG9792
Int. Cl.[4] A01F *25/13*
U.S. Cl. 98—57 **5 Claims**

1. A method of preventing, arresting or reducing the accumulation of moisture in particulate durable foodstuff in a bunker storage having a moisture-impervious sheet over the stored foodstuff comprising the steps of:

(a) inserting at least one top-venting pipe substantially vertically into said foodstuff, through said sheet, for a distance such that the lower end of said top-venting pipe is below the region where the particulate foodstuff in the bunker consolidates and the upper end of said top venting pipe is above said sheet;

(b) removing any of said foodstuff that may be present in said or each inserted top-venting pipe;

(c) providing a rain shield on the upper end of said or each top-venting pipe;

(d) inserting at least one side-venting pipe into said foodstuff at the side of the bunker, through said sheet;

(e) removing any of said foodstuff that may be present in the or each side venting pipe; and

(f) closing the outer end of said or each side-venting pipe with a closure member which includes a perforated or mesh-covered region which permits air to pass therethrough.

4,690,042

COMPUTER ENVIRONMENT FILTER APPARATUS HAVING WING WITH INTERNAL BAFFLES

Matthew H. Bertelsen, 3060 Baker Rd., Dexter, Mich. 48130, and Gary Klapperich, Dexter, Mich., assignors to Matthew H. Bertelsen, Dexter, Mich.

Filed May 27, 1986, Ser. No. 866,749
Int. Cl.[4] F23J *11/00*
U.S. Cl. 98—115.1 **14 Claims**

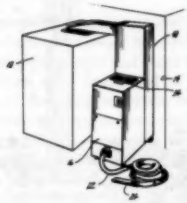
1. Filter means for use in a computer room for removing paper dust, carbon black and the like from the air being discharged from a high speed paper handling machine, such as a laser printer, comprising:

a filter housing having an upper discharge opening for passing filtered air, and a lower inlet opening for receiving unfiltered air;

an electrically energized fan in the filter housing, the fan being operative to move air from the paper handling machine to the filter housing and toward said upper discharge opening;

filter pack means in the filter housing for removing material from air being passed therethrough, said filter pack means being mounted in the filter housing between the upper discharge opening and the lower inlet opening;

an elongated hollow wing, and an elongated upright duct having an upper end supporting the wing in a raised position above the filter housing and a lower end connected to the filter housing such that the wing and the filter housing are moveable together with respect to the paper handling machine, the upright duct being disposed such that air being discharged from the paper handling machine is passed through both the wing and the upright duct toward the filter housing, the wing having an inlet opening with a first cross sectional area, and a longitudinally spaced outlet opening having a second, lesser cross sectional area, the wing inlet opening being disposed to receive air from the paper handling machine along a path generally at right angles to the longitudinal axis of the wing, the wing outlet



opening being disposed to pass air toward the upright duct and the filter housing;

an elongated, planar first baffle member mounted within the wing generally parallel to the longitudinal axis of the wing;

the first baffle member having a forward edge disposed to divide the inlet opening into a pair of sections including a first section having a first area and a second section having a second area, the second section being disposed between the first section and the outlet opening of the wing, the first baffle member being disposed to generally face the flow of air from the paper handling machine to change the direction of such air flow as it passes through the wing from the inlet opening to the outlet opening; and

a second baffle member disposed downstream of the first baffle member and facing the direction of air flow through the outlet opening of the wing to change the direction of such air flow from a direction generally parallel to the longitudinal axis of the wing toward a direction at an angle to said longitudinal axis and through the upright duct.

4,690,043

PIZZA DOUGH SPREADING APPARATUS

Victor C. Pacilio, P.O. Box 10516, Phoenix, Ariz. 85064

Filed Aug. 20, 1985, Ser. No. 767,727
Int. Cl.[4] A21C *11/00*
U.S. Cl. 99—353 **5 Claims**

1. Apparatus for spreading a body of dough to form a generally circular soft pizza crust, comprising

(a) a support surface for receiving a body of dough;

(b) dough retaining means for controlling the centrifugal spreading of said body of dough on said support surface, including

(i) a frame member contacting said tray and circumscribing said body of dough,

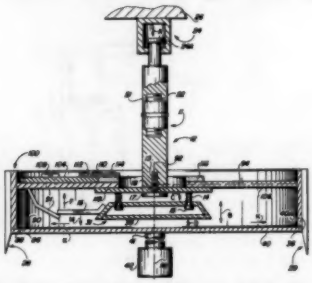
(ii) a support structure centered in and connected to said frame member,

(iii) a plurality of arm-linkage means connected to said support structure and extending outwardly from said support structure toward said frame, each of said arm-linkage means having an outer end adjustable inwardly toward and outwardly away from said support structure,

(iv) a plurality of guides, each attached to said outer end of one of said arm-linkage means,

(v) a plurality of flexible strips, each having one end affixed to one of said guides and extending to be slidably received in an another of said guides to define a variable diameter peripheral annular rim around said body of dough, said diameter of said peripheral annular rim being varied by adjusting said arm-linkage means and guides attached thereto inwardly and outwardly from said support structure,

(vi) a generally continuous circular flat planar surface



attached to said support structure above said support surface and

terminating at a peripheral edge, and

continuously contacting a central portion of said body of dough during centrifugal spreading said dough, said central portion of dough contacted by said flat planar surface, said peripheral edge of said planar surface circumscribing said central portion of said body of dough,

(vii) means for urging

said flat planar surface into continuous contact with said central portion of said body of dough, and

said flat planar surface toward said support surface and away from said support structure

during the centrifugal spreading of the body of dough; and

(c) motive power means for rotating said support surface to centrifugally spread said body of dough, said rotation of said support surface causing said dough retaining means to simultaneously rotate with said support surface.

4,690,044

HAMBURGER COOKING APPARATUS

Charles E. Verkler, Peoria, Ill., assignor to International Food Equipment Inc., Peoria, Ill.

Filed Oct. 27, 1986, Ser. No. 923,200

Int. Cl.[4] A47J *37/04*

U.S. Cl. 99—419 **10 Claims**

1. A device for cooking food products such as hamburger patties comprising:

grill means of a heat conductive material for impaling and holding the food product;

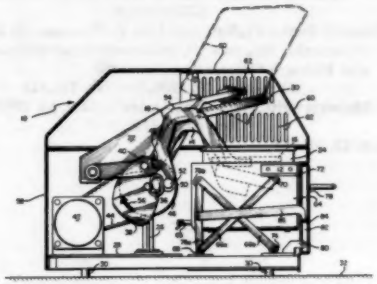
a grill arm having first and second ends, the first end supporting the grill means;

support means for pivotally mounting the second end of the grill arm;

fork means interfittable with the grill means so as to underlie a food product impaled thereon, the fork means being movable with respect to the grill means to selectively remove a food product impaled thereon;

a fork arm having first and second ends, the first end supporting the fork means and the second end pivotally mounted with respect to the grill arm;

stationary former means disposed above the first ends of the grill arm and fork arm for engagement with the grill means and fork means;



reservoir means for containing a heated cooking liquid disposed below the first ends of the grill arm and fork arm; and

oscillating means for moving the grill means and fork means between a first position adjacent the stationary former means and a second position in which the grill means and fork means are immersed in the heated cooking liquid held in the reservoir means, the grill means and the fork means being moved in unison when moving from their first position to their second position, but separately, with the fork means leading the grill means, when moving from their second position to their first position.

4,690,045

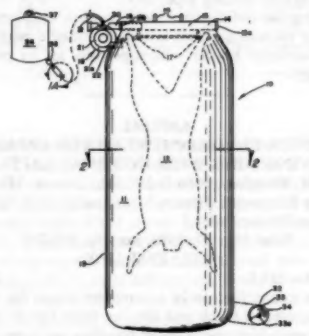
UTILITY GAME BAG SYSTEM

Robert J. T. Badger, 2510 Alden St., Salt Lake City, Utah 84106

Filed Jul. 11, 1985, Ser. No. 753,774

Int. Cl.[4] A23L *3/00*

U.S. Cl. 99—485 **11 Claims**



1. A game bag system comprising, a game bag having length, width and thickness dimensions sufficient to contain an animal carcass therein and including an opening and closure means therefore for providing access to said game bag interior; a

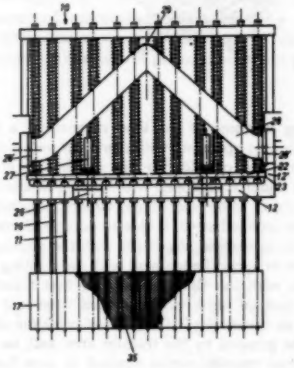
hanger means for connection in supporting engagement to said game bag for supporting said game bag; blower means for arrangement with said game bag such that a discharge nozzle thereof is arranged to discharge into said game bag, said blower means to provide an airflow into said game bag that is pulled through an inlet thereof; a filter mat canister means for coupling to said blower means, over an inlet thereof, such that a filter mat means therein will be positioned to extend across said blower means inlet; and means for providing water to wet said filter mat wherethrough said blower pulls an airflow.

4,690,046

INJECTING MACHINE FOR MEAT PIECES

Narciso L. Corominas, Gerona, Spain, assignor to Metalquimia, S.A., Gerona, Spain

Filed Jan. 11, 1985, Ser. No. 690,596
Claims priority, application Spain, May 7, 1984, 532.269
Int. Cl.[4] A23L *3/34;* A23B *4/00*
U.S. Cl. 99—533 **5 Claims**



1. An improved apparatus for injecting pressurized fluid into conveyored meat pieces, comprising:

a relatively fixed base plate;

a movable head assembly;

a plurality of multi-orificed needles which are mounted in said movable head assembly;

a plurality of transverse pressing blocks disposed between the meat piece and said relatively fixed base plate of said movable head assembly;

a series of vertical cylindrical ducts disposed in parallel rows along a length of said pressing blocks so as to permit the passage of said needles therethrough, and which are arranged such that said parallel rows of ducts are mutually offset in a quincunx-like pattern of ultimate injection holes in the meat piece;

a dual diameter configuration for each of said vertical cylindrical ducts wherein an upper section of each said duct is somewhat larger than a respective diameter of a corresponding one of said needles, and a lower section of each one of said ducts is nearly equal to said diameter so that each said duct serves as a guide formed by said corresponding one of said needles and said upper section; said chamber tending always to be filled with fluid which has been fed to the needle by fluid pressure during injection, and under the influence of gravity before and after injection; and

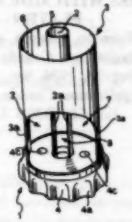
a means for reducing flow and pressure of an injection fluid when each said upper fluid chamber of said ducts overflow an entire set of pressing blocks and fall onto a meat conveyor floor, whereby said fluid can be recycled to said head assembly without introduction of air or foam.

4,690,047

TOOL FOR PEELING AND CORING PINEAPPLES AND THE LIKE

Savino Balzano, Torino, Italy, assignor to Metallurgiche Balzano S.p.A., Verres, Italy

Filed Mar. 4, 1986, Ser. No. 836,067
Claims priority, application Italy, Mar. 5, 1985, 53094/85[U]
Int. Cl.[4] A47J *25/00;* B26B *3/00*
U.S. Cl. 99—542 **6 Claims**



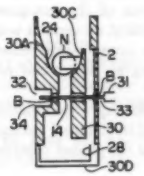
1. Tool for cleaning for consumption fruit having a core and a skin which are to be thrown away, between which is a fleshy part to be eaten, comprising inner and outer substantially annular and coaxial blades each comprised of a single elongate tubular body, each of the elongate tubular bodies of the blades having a frontal cutting edge at one end thereof, the tool further including a handgrip connecting the ends of the elongate tubular bodies opposite the cutting edges, the handgrip enabling the blades to be pushed into the fruit and rotated so as to achieve separation of the core and the skin from the fleshy part through the action of the cutting edge of the inner blade and the cutting edge of the outer blade respectively, and in that the tubular bodies of the inner blade and the outer blade each have associated elongate parts that are connected by the handgrip which constitute, together with the edge associated therewith, regions of said single tubular bodies extending from the handgrip to the cutting edge of the associated blade, each single tubular body being defined by a wall that is substantially smooth.

4,690,048

NUTCRACKER

Bahram Namdari, P.O. Box 17366, Milwaukee, Wis. 53217

Filed Jun. 3, 1985, Ser. No. 740,568
Int. Cl.[4] A23N *5/00*
U.S. Cl. 99—575 **10 Claims**



1. A nutcracker comprising:

a pair of relatively movable members, said members include adjacent confronting surfaces which cooperate to define a nut-receiving chamber;

means for mounting said members for relative movement and for maintaining said members in predetermined spaced apart relationship;

restricting means on the adjacent confronting surfaces of said members which cooperate to diminish said nut-receiving chamber in size as said members are moved

relative to each other, said chamber diminishing in size from a first size sufficient to accommodate a whole nut to a second size whereby the nut is crushed; and

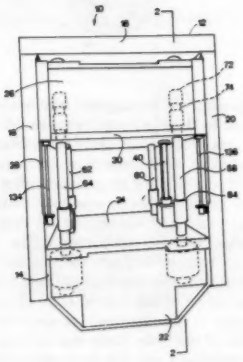
means on one of said members for preventing passage of the nut beyond a predetermined degree of rotation of said members.

4,690,049

HYDRAULIC PRESS WITH SIDE SLAB GUIDED UPPER PLATEN

Leon Malashenko, Toronto, Canada, assignor to John T. Hepburn, Limited, Mississauga, Canada

Filed Oct. 24, 1986, Ser. No. 922,542
Claims priority, application Canada, Nov. 12, 1985, 495086
Int. Cl.[4] B30B *7/02*
U.S. Cl. 100—214 **7 Claims**



1. A hydraulic press, comprising:

a support structure including a base structure which defines a lower platen;

an upper moveable platen;

guide means mounted on the support structure for guiding the upper platen vertically towards and away from the lower platen;

a multiplicity of compression-phase hydraulic cylinders each having a body member fixed to the base structure and a piston rod oriented for vertical movement relative to the body member;

a multiplicity of vertical posts, each of the posts being fixed to a different one of the compression-phase hydraulic cylinders for vertical movement with the piston rod associated with the compression-phase hydraulic cylinder, each post having an upper end portion formed with a recess;

the upper platen having a multiplicity of internal vertical passages, each of the internal passages being aligned with, and dimensioned for guided passage of, one of the multiplicity of posts;

releasable locking means attached to the upper platen for locking the upper platen to the vertical posts, the releasable locking means including a multiplicity of lock members and controllable lock member displacement means for displacing the lock members at least horizontally between locking positions in which the lock members engage the recesses in the posts and unlocking positions in which the lock members are disengaged from the posts; and,

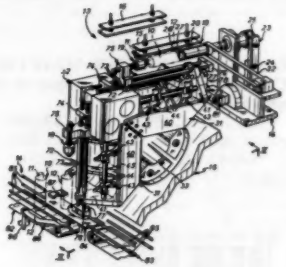
upper platen displacement means attached to the support structure for raising and lower the upper platen when the locking means are disengaged from the posts.

4,690,050

TRANSFER SYSTEM FOR ARTICLE PRINTING MACHINE

Eric Rouly, Pontault Combault; Jean-Louis Dubuit, Paris, and Gilles Marette, Coulommiers, all of France, assignors to Societe d'Exploitation des Machines Dubuit, Paris, France

Filed Nov. 12, 1985, Ser. No. 796,775
Claims priority, application France, Nov. 13, 1984, 84 17301
Int. Cl.[4] B41F *17/20*; B65G *47/52*
U.S. Cl. 101—35 **23 Claims**



1. Printing machine of the kind comprising a horizontal printing station co-operating with conveyor means disposed at a level below that of said printing station and at least one transfer arm which is equipped with holding means adapted to support an object to be printed and which, mounted to rotate about an axis inclined at 45, is able to occupy alternately two positions, one in vertical alignment with the conveyor means and the other in vertical alignment with the printing station, in combination with, on the one hand, a first transfer means adapted to pass an object to be printed from said conveyor means onto an exchange platform, in order for the object to be printed to be grasped by the transfer arm, and, on the other hand, a second transfer means adapted to pass from the exchange platform to the conveyor means an object already printed previously put down by the transfer arm, characterized in that there are two rotatable transfer arms having a common rotation axis and disposed at 90 relative to each other, one on each side of their common rotation axis and in a plane containing the latter, and which alternately occupy a vertical position on the exchange platform and a horizontal position at the printing station, and each of the transfer arms having holding means which comprises at least one transverse clamp having two transverse branches each of which is fitted at a free end with a jaw adapted to surround at least partially, in conjunction with the jaw of the other branch, an object to be printed.

4,690,051

METHOD OF IMAGE REGISTRATION IN A WEB FED, MULTIPLE PRINTING ROTARY PRESS

Toshiaki Kishine; Hideo Izawa, both of Yachiyo, and Masaru Ohba, Funabashi, all of Japan, assignors to Miyakoshi Printing Machinery Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1986, Ser. No. 828,737
Int. Cl.[4] B41F *5/06, 5/16, 13/14*
U.S. Cl. 101—211 **4 Claims**

1. A method of achieving image registration in a web fed rotary printing press of the type including a series of print stations, each having a circumferentially and laterally adjustable plate cylinder, for successively printing images on a continuous web of material traveling along a predetermined path, which method comprises:

(a) preparing printing plates for the respective print stations of the web feb rotary press, each prepared printing plate hearing in a preassigned different position thereon a registration mark having two nonparallel line segments gener-

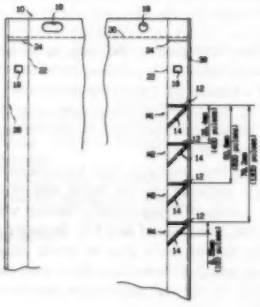
ally extending transversely with respect to the web, the relative positions of the registration marks on the prepared printing plates being such that when the printing plates are mounted on the respective plate cylinders in proper registration, the images of the registration marks thereby reproduced on the web are arranged in a row in the longitudinal direction of the web at predetermined distances from one another:

(b) mounting the above prepared printing plates on the respective plate cylinders of the press;

(c) starting the printing of images, including those of the registration marks, from the printing plates on the web traveling along the predetermined path at a predetermined speed;

(d) optically sensing the printed images of the registration marks on the traveling web at a predetermined point intermediate the opposite extremities of the registration mark images in the transverse direction of the web, in order to ascertain the actual distances between the registration mark images and the actual distance between the two line segments of each registration mark image at the predetermined intermediate point thereof;

(e) converting the above ascertained actual distances into corresponding numbers of periodic reference pulses;



(f) comparing the numbers of reference pulses representing the actual distances between the registration mark images and between the two line segments of each registration mark image with prescribed numbers of such reference pulses representing the proper distances between the registration mark images and a proper spacing between the two line segments of each registration mark image, respectively;

(g) adjusting the angular position of any one or more of the plate cylinders in accordance with a difference or differences, if any, between the reference pulse numbers representative of the actual distances between the the registration mark images and the prescribed reference pulse numbers representative of the proper distances therebetween; and

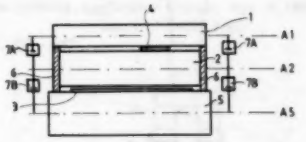
(h) adjusting the lateral position of any one or more of the plate cylinders in accordance with a difference or differences, if any, between the reference pulse number representative of the actual distance between the two line segments of each registration mark image and the prescribed reference pulse number representative of the proper distance therebetween.

4,690,052

MEANS FOR COMPENSATING FOR VARIATIONS IN THE MATRIX HEIGHT AND OPTIONALLY THE PAPER THICKNESS ON A ROTARY PRINTING MACHINE

Gustav Paulsen, Ovre Strandgt. 107, N-4000 Stavanger, Norway

Filed Jun. 28, 1985, Ser. No. 749,824
Claims priority, application Norway, Aug. 24, 1984, 843379
Int. Cl.[4] B41F 5/00
U.S. Cl. 101—216 **6 Claims**



1. A means for compensating for variations in matrix height (thickness) and optionally variations in paper thickness on a rotary printing press, especially a rotogravure printing press which comprises cooperating pairs of rollers/cylinders including at least one inking roller (1) for transferring ink or the like to a matrix (4) detachably mounted on a matrix cylinder (2) that cooperates with the inking roller (1), the matrix (4) being adapted in turn to transfer the ink or the like to a moving web of paper (3) which passes over and is intended to be pressed against the matrix (4) by a counterpressure cylinder (5) which thus is adapted to cooperate with the matrix (2), means for supporting the rollers/cylinders, wherein the center-to-center distance between the axes of cooperating pairs of rollers/cylinders (A1-A2 and A2-A5) is adjustable for adapting to varying matrix and/or paper thicknesses, power driven means for causing a power driven relative movement between cooperating pairs of rollers/cylinders transversely to their longitudinal axes for adjusting said center-to-center distance, characterized in that the power driven means are flexible power driven means (7A, 7B), and that the supporting means for the cooperating pairs of rollers/cylinders (1-2 and 2-5) also comprise compensating means in the form of flexible spacer members (6; 6A, 6B; 9A, 9B) which upon a reduction of said center-to-center distance (A1, A2; A2-A5) are capable of being compressed with elastic deformation, such that the flexible spacer members (6; 6A, 6B; 9A, 9B) provide a counterforce against the flexible power driven means (7A, 7B), and that the reduced center-to-center distance between the cooperating pairs of rollers is defined by equilibrium between forces from the flexible means (7A, 7B) acting on respective pairs of rollers/cylinders and forces from the flexible spacer members and that the reduced center-to-center distance is flexible for adapting and accommodating variations in the matrix height and/or paper thickness.

4,690,053

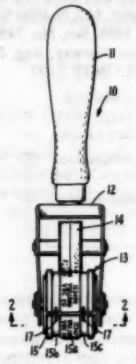
ROLLER STAMP CONSTRUCTION

Gary D. Munyon, Concord, and Matthew J. Swiech, Antioch, both of Calif., assignors to G & B Rubber Stamp Co., Inc., Concord, Calif.

Filed Nov. 18, 1985, Ser. No. 799,257
Int. Cl.[4] B41F 5/00
U.S. Cl. 101—328 **4 Claims**

1. A roller stamp for imprinting sheet material with indicia, said stamps having a handle, a support frame mounted from one end of said handle, and a pair of rollers rotatably mounted on parallel axes from the frame, one of said rollers being a die roller, said roller being formed of wood, the other roller being an inking roller, the improvement comprising: a die strip formed of flexible plastic material that encircles the die roller, the ends thereof being adjacent or abutting, said die strip having a central embossed printing surface and recessed surface areas on either side thereof; and a pair of staples that engage the adjacent ends of said die strip within said recessed areas, each staple comprising a pair of legs that project substantially

perpendicular to a connecting member, one leg of each staple being engaged with one end of said die strip and embedded in



said die roller, the other leg of each staple being engaged with the other end of said die strip and embedded in said die roller.

4,690,054

SHEET FEED DRUM FOR ROTARY PRESSES

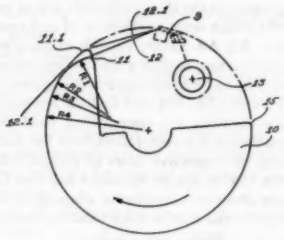
Bert Cappel, Muhlheim; Karl L. Knapp, Obertshausen, and Adolf Jung, Muhlheim, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 4, 1986, Ser. No. 836,007

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507925

Int. Cl.[4] B41F *21/10, 29/02*

U.S. Cl. 101—409 **1 Claim**



1. A sheet feed drum for transferring freshly printed sheets in a rotary printing press wherein the drum outer contour is provided with an ink-repellent coating and two circumferentially spaced front and rear drum edges defining a duct therebetween which accommodates a sheet gripper system, said ink-repellent coating supporting a netting-like fabric relatively loosely thereon, said fabric preventing any smearing of a freshly printed underside of a sheet during sheet feed on the drum while the sheet is engaged by the gripper system, characterized in that starting at the front edge of the drum, the outer contour of the drum is constructed in the form of a smooth and continuously increasing spiral curve merging into a fixed drum radius whereby the netting-like fabric is contactable by the freshly printed underside of the sheet on the spiral surface first substantially flatly behind the front edge of the drum and then in any subsequent angle of rotation of the drum without the sheet tangent ever being bent or creased, which would cause smearing and distortion of the ink on the printed underside of the sheet.

4,690,055

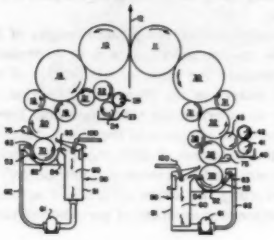
KEYLESS INKING SYSTEM FOR OFFSET LITHOGRAPHIC PRINTING PRESS

Thomas A. Fadner, La Grange; Edward R. Harenza, Chicago; Stanley H. Hycner, Bartlett, and Nelson M. Robinson, Naperville, all of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 28, 1986, Ser. No. 901,236

Int. Cl.[4] B41F *7/26, 7/32, 31/04, 31/06*

U.S. Cl. 101—451 **12 Claims**



1. In an offset lithographic printing press having blanket cylinder, plate cylinder with printing mounted thereon, form cylinders, and a system for supplying dampening water to the printing plate an improved inking system comprising:

A. ink pan means for holding and circulating an ink and water mixture including:

(i) a tray portion having a first longitudinally extending wall area defining the ink input side of said tray and having a second longitudinally exiting wall area defining the ink input side of said tray having a second longitudinally exiting wall area of lower height than first wall area which defines an outflow weir that determines the depth of the ink and water mixture in said tray portion;

(ii) a reservoir portion adjacent said tray portion to receive the ink and water mixture flowing from said tray portion over said outflow weir;

(iii) means for introducing ink and water into the input side of said tray portion along the entire length thereof;

(iv) pump means connected to said reservoir portion and to said ink and water mixture introducing means to circulate the mixture therebetween;

(v) means for introducing fresh replacement ink for that used by the printing process;

B. a pan roller mounted within said tray portion and having an outer compressible, oleophilic surface that is spaced from said first and second longitudinal wall areas a distance such that rotation of said pan roller causes flow of ink or an ink and water mixture toward said outflow weir;

C. a hard oleophilic and hydrophobic celled metering roller mounted above said pan roller and in positive interference therewith to receive ink and ink and water mixture from said pan roller and deliver it to inking form roller;

D. scraping blade mounted for contact with said celled metering roller at a location causing excess ink and water mixture to be returned to said tray portion in the area defining the ink and water mixture input side of said tray portion; and

E. an ink level measuring device operating on the ink pan contents to actuate the means for replenishing ink used up during operation.

4,690,056

ELECTRIC DETONATOR DEVICE

Uwe Brede, Furth, and Gerhard Kordel, Nuremberg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,905
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1984, 3403179
Int. Cl.[4] F42B *3/18*; F42C *19/12*
U.S. Cl. 102—202.2 22 Claims

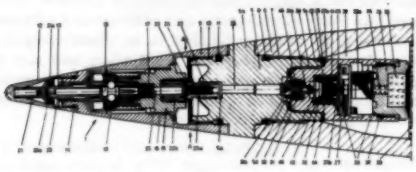
1. An electric detonator device comprising an electrically insulating carrier member carrying an ignition bridge and first and second electrodes connected to the ignition bridge, at least one of the first and second electrodes being in the form of a layered conductor path configured to provide a high-frequency filter, whereby the connection of the ignition bridge to the at least one of the first and second electrodes formed as a layered conductor path configured to provide a high frequency filter is only by the layered conductor path thereof.

4,690,057

HIGH VELOCITY PROJECTILE

Gengt Carlsson, Örebro, Sweden, assignor to AB BOFORS, Bofors, Sweden

Filed May 19, 1986, Ser. No. 864,379
Claims priority, application Sweden, May 24, 1986, 8502575
Int. Cl.[4] F42C *9/14*
U.S. Cl. 102—266 10 Claims



1. A high velocity projectile for penetration of both soft and hard targets and exploding the payload after penetration comprising:

forward and rear portions of a projectile body;

a barrier member made of a high strength material separating said forward and said rear portions, said rear portion including a casing member;

a fuse detonatable on impact with a target and operating either by high sensitivity on impact against soft targets or by delayed action, which allows explosion of the main charge after penetration, said fuse including a delayed action charge, located in said rear portion of said projectile body behind said barrier member thereby being protected against detonation by shock waves produced in the forward portion, said charge being disposed in a hollow cylindrical portion which is resiliently mounted within said casing member by means of elastic annular ring members damping movements of said cylindrical portion in both axial and radial direction; and

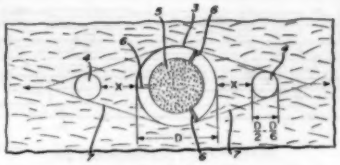
an effectuating unit disposed between said barrier and said delayed action charge for providing a reliable ignition of said delayed action charge in the detonated state of said projectile.

4,690,058

SMOOTH WALL BLASTING IN ROCK

Bibhuti B. Mohanty, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Canada

Filed Feb. 27, 1987, Ser. No. 20,119
Claims priority, application Canada, Apr. 9, 1986, 506242
Int. Cl.[4] F42D *3/00*
U.S. Cl. 102—312 6 Claims



1. An improved method of smooth wall blasting with explosives in rock comprising the steps of:

(a) drilling a group of aligned, triad boreholes in a rock body, the said triad group comprising a larger central borehole for explosive charging and one, empty, smaller, close-spaced, parallel satellite borehole on each side of the said central borehole;

(b) drilling a series of said group of triad boreholes at intervals along a line of desired crack or fracture in said rock;

(c) charging the said larger central borehole in each of said triad groups with explosives; and

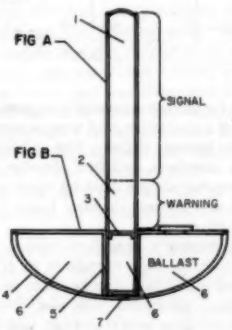
(d) detonating the said charged boreholes to produce a flat plane crack or fracture intersecting each of the said triad groups and in alignment therewith.

4,690,059

METHOD OF MAINTAINING AN UNINTERRUPTED WARNING SIGNAL

Edgar E. Fischer, 936 Johnston Dr., Watchung, N.J. 07060

Filed Feb. 24, 1986, Ser. No. 832,318
Int. Cl.[4] F42B *4/24, 4/20*
U.S. Cl. 102—336 2 Claims



1. A method of maintaining an uninterrupted warning signal comprising:

(a) lighting a warning flare which changes color a predetermined time before burnout to alert a user that burnout is approaching; and

(b) providing another warning means when the flare changes color.

4,690,060

GENERATING GAS PRESSURE IN AN EXPANSION CHAMBER

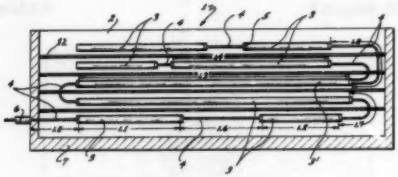
Albert Dietrich, Markdorf, Fed. Rep. of Germany, assignor to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 28, 1985, Ser. No. 695,688

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1984, 3403352

Int. Cl.[4] C06D *5/00*; F41F *1/00*; F42B *13/50*

U.S. Cl. 102—352 7 Claims



5. Device for the generation of gas pressure by means of explosive charges and including at least one expansion chamber comprising

a plurality of propellant explosive charge hoses alternating with and being serially interconnected by a plurality of ignition charge hoses; and

means for shielding at least some of said hoses from said hoses from others as far as pressure is concerned.

4,690,061

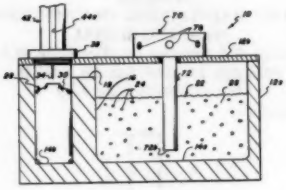
LAND MINE FOR USE IN A SIMULATED WAR GAME

Leon N. Armer, Jr., 22 Utica St., Brockport, N.Y. 14420; Joseph M. Antonio, 151 Rosecroft Dr.; Craig A. Roth, 241 Haviland Pk., both of Rochester, N.Y. 14616, and James R. VerWeire, 48 Ogden Ctr. Rd., Spencerport, N.Y. 14559

Filed Nov. 21, 1985, Ser. No. 800,203

Int. Cl.[4] F42B *23/22*

U.S. Cl. 102—401 4 Claims



1. A weapon, for use in a simulated war game, exhibiting the characteristics of a land mine, said weapon comprising:

a housing, said housing defining first and second intercommunicating chambers, said first chamber being loadable with a slurry including a marking agent and a dispersing agent, and said second chamber being loadable with a slurry propellant;

means for activating a propellant loaded in said second chamber to enable such propellant to drivingly force a slurry loaded in said first chamber from said first chamber;

directing means, associated with said first chamber, for defining an exit flow path therefrom, said directing means including a receptacle, means for adjustably mounting said receptacle on the exterior of said housing adjacent to said first chamber, an opening defined in a wall of said housing between said first chamber and said receptacle enabling flow communication therebetween, and a plurality of openings defined in an exterior wall of said receptacle, whereby adjustment of said receptacle orients said openings in a desired direction; and

a trigger mechanism operatively associated with said activating means for actuating said activating means.

4,690,062

WARHEAD, ESPECIALLY FOR THE ATTACKING OF RADAR INSTALLATIONS

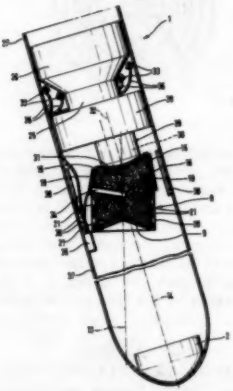
Horst G. Bugiel, Bonn, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jun. 24, 1986, Ser. No. 877,795

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1985, 3525147

Int. Cl.[4] F42B *11/22*

U.S. Cl. 102—476 11 Claims



1. A steeply diving airborne body including a propulsion motor and a warhead for the attacking of quasistationary targets possessing armor reducing in strength along the vertical extension thereof, especially radar installations; the improvement comprising: said warhead including an explosive encompassed by a frusto-conical casing area constituted of a fragmentation casing; an oxidizer container in an effective region of said explosive arranged between a propellant tank and said explosive; and operational components of said propulsion motor being located at an opposite side of said propellant tank relative to said oxidizing container.

4,690,063

ULTRARAPID GAS GENERATOR WITH INCREASED SAFETY

Georges Granier, Viry Chatillon, and Yves Valliere, Le Beuzit, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Aug. 28, 1985, Ser. No. 770,504

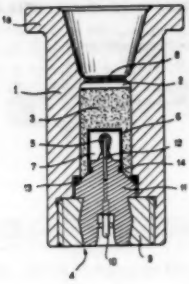
Claims priority, application France, Sep. 5, 1984, 84 13635

Int. Cl.[4] F42B *5/20, 9/18*

U.S. Cl. 102—530 15 Claims

1. An ultrarapid gas generator, utilizable in particular on a motor vehicle, which comprises a mechanically resistant body (1) forming a combustion chamber (2), a closure means (8) for the combustion chamber, a gas generating charge (3) within the combustion chamber, an initiation plug (4) which comprises an ignition bead (5) fired by means of a resistant filament and which is fixed on the body (1) and penetrates into the combustion chamber, wherein the initiation plug (4) has a hood (6) forming a leaktight initiation chamber (7) around said ignition bead (5), whereby said ignition bead is separated from the gas generating charge (3), the gas generating charge is com-

posed of grains of powder based on nitrocellulose and of a pulverulent oxidoreduction powder containing at least one



metal and said gas charge, is disposed entirely outside the hood.

4,690,064

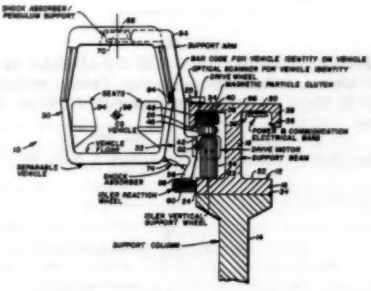
SIDE-MOUNTED MONORAIL TRANSPORTATION SYSTEM

William E. Owen, 481 S. Keeler Woods Dr., Marietta, Ga. 30064

Filed May 20, 1986, Ser. No. 865,022

Int. Cl.[4] E01B *25/08*; B61B *13/04*; B61C *13/04*

U.S. Cl. 104—119 **17 Claims**



1. A monorail transit system, comprising:

a beam adapted to be supported on a ground-supported foundation, said beam having two opposite sides, at least one of which has respective truck means provided thereon;

a transit car body;

at least one transit car truck and a transit car guide means for each transit car body;

each said transit car truck and each said transit car guide means comprising a frame having first wheel means mounted thereon for rotation and disposed in rolling engagement with said track means for providing vertical support, and second and third wheel means mounted thereon for rotation and disposed in rolling engagement with said track means for providing horizontal support;

each said transit car truck and said transit car guide means further including an arm based on the respective said frame and arching upwardly and outwardly therefrom to an upper outer end at which a respective first securement means is provided;

each said transit car truck and said transit car guide means for each car body being spaced from one another longitudinally of the respective said track means;

each transit car body, above the center of gravity thereof having a plurality of second securement means provided thereon, said second securement means being spaced from one another longitudinally of the respective said transit car body;

each said second securement means being secured to a respective said first securement means for dependingly supporting each respective transit car body from said beam via a respective said at least one transit car truck and a respective said transit car guide means;

each said transit car truck further including motor means for powering one of said first and second wheel means for effecting transportation of each said transit car along the respective said track means of said beam.

4,690,065

AUTOMOBILE CONVEYOR

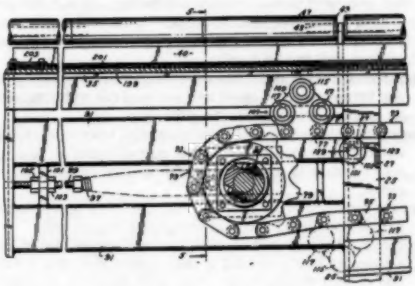
James A. Belanger, Northville; Robert Wentworth, Ann Arbor, and James M. Lapham, Northville, all of Mich., assignors to Belanger, Inc., Northville, Mich.

Continuation of Ser. No. 498,254, May 26, 1983, Pat. No. 4,576,098. This application Jan. 2, 1986, Ser. No. 815,618

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.[4] B61B *10/00*

U.S. Cl. 104—172.3 **12 Claims**



1. In an automobile conveyor having an elongated framework including a pair of spaced top plates for supporting the tire of an automobile movable thereover, an endless sprocket chain having upper and lower runs movably positioned within said framework below said top plates and extending around drive and driven sprockets within and adjacent opposite ends of said framework, and a plurality of roller dollies within said framework spaced along the length of, connected to and projecting outwardly of said sprocket chain;

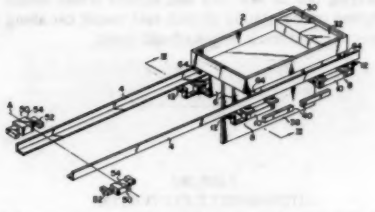
the improvement comprising said driven sprocket having bearing members on opposite sides thereof, said bearing members being rotatably mounted upon a transverse sprocket shaft, said sprocket shaft being mounted between opposed carriage blocks; each of said carriage blocks including a split collar having first and second sections for supporting said shaft; said first section being fixedly attached to said carriage block below said shaft opposite said top plates at an angle to the vertical such that said shaft is cradled against the pulling force of said drive sprocket; said second section being removably attached by attachment means to said first section about said shaft; said attachment means being accessible from said top plate to permit removal of said second section and then removal of said driven sprocket, bearing members and transverse sprocket shaft through said top plates.

4,690,066

ELECTROMAGNETICALLY FLOATED CARRIER SYSTEM WITH STOPPING UNIT

Mimpei Morishita, and Teruo Azukizawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 25, 1985, Ser. No. 726,982
Claims priority, application Japan, Jun. 30, 1984, 59-135987
Int. Cl.[4] B61B *13/08*
U.S. Cl. 104—282 **19 Claims**



1. A system for transporting cargo to a predetermined position, comprising:

a carrier for carrying cargo;

at least one rail extending along the travelling path of said carrier, at least the lower portion of said rail being made of a ferromagnetic material;

means including a plurality of magnet units each having at least one permanent magnet and at least one electromagnet, provided on said carrier and facing said rail, for generating electromagnetic force that floats said carrier with respect to said rail, a gap being provided between each magnet unit and said rail;

gap sensor means provided on said carrier for sensing the gap between each magnet unit and said rail and generating an output signal representing this gap;

means for energizing said electromagnets with an excitation current in accordance with the output signal of said gap sensor means to make the gap fall within a predetermined range;

means provided on said carrier for supplying power to said gap sensor means and said energizing means; and

a station, at which said carrier is to be stopped, and at least a stopping unit provided at said station such that it faces one of said magnet units when said carrier is stopped at said station, said carrier being stopped upon arrival at said station by electromagnetic forces of attraction acting between said stopping unit and magnet unit.

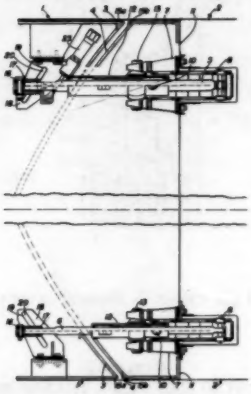
4,690,067

DEVICE FOR INTERCONNECTING A PORTAL PASSAGEWAY BETWEEN TWO RAIL VEHICLES

Wolfgang Küker, and Heinz Findeklee, both of Salzgitter, Fed. Rep. of Germany, assignors to Linke-Hofmann-Busch, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,427
Claims priority, application Fed. Rep. of Germany, May 19, 1984, 3418679
Int. Cl.[4] B61D *17/20*; B60D *5/00*
U.S. Cl. 105—3 **9 Claims**

1. A device for interconnecting a portal passageway between two rail cars, comprising an engagement member connected to one end of one rail car, a portal mounted between the cars, said engagement member and portal having curved opposed parting surfaces with a common center of curvature and a selected gap width therebetween, a sleeve for guiding said parting surfaces pivotally said sleeve being mounted for pivotal movement to the one end of the one rail car and about a vertical axis spaced from said parting surfaces, a carrying arm axially movable in said sleeve, means for holding said sleeve against rotation to the one end of rhe one car, means on the one car for confining one end of said arm for arcuate movement in a horizontal plane, a cross piece mounted to the opposite end of said arm for pivotal movement about a vertical axis, a fixed frame connected to said portal and having a frame guide with a radius having the same center of curvature as said parting



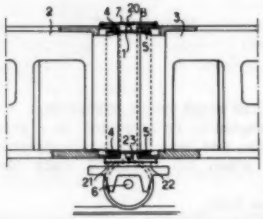
surfaces, said frame guide extending in a vertical plane and confining vertical movement of said cross piece, said frame guide and the arcuate movement to which said one end of said arm is confined having a shape for maintaining the selected gaps between said parting surface.

4,690,068

INTER-CARRIAGE PASSAGE FOR A RAILWAY TRAIN

Paul Delfourne, Villeneuve-La-Garenne, France, assignor to R.A.T.P. Regie Autonome des Transports Parisiens, Paris, France

Filed Oct. 1, 1985, Ser. No. 782,687
Claims priority, application France, Oct. 2, 1984, 84 15100
Int. Cl.[4] B61D *17/20*
U.S. Cl. 105—8.1 **2 Claims**



1. In a railway carriage set, an inter-carriage passage comprising an intermediate bodywork member of generally annular shape in overlapping relation with adjoining ends of two carriages of said carriage set, a single axle carrying said adjoining ends, and positioning means for positioning said intermediate member so that a transverse median plane thereof extends midway between said carriage ends and generally radially with respect to any curve on which said carriage set is disposed, said positioning means comprising cooperating guide means on said axle and on said intermediate body member for maintaining said transverse median plane in substantial alignment with said axle, and linkage means disposed at an upper part of said intermediate member and pivoted on a point in a longitudinal median plane of said intermediate member, said linkage means being connected between said adjoining carriage ends to accomodate expansion and contraction of an inter-carriage gap, a

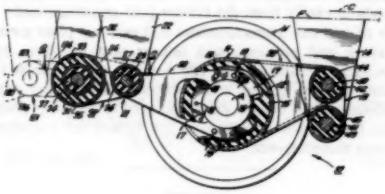
deformable pneumatic joint disposed between the overlap of said intermediate member with each said carriage end, said joint being hollow and generally toroidal in shape so as to provide a substantially continuous seal of said overlap, and splines on said pneumatic joint in meshing engagement with respective splines on each of said carriage and said intermediate body member in order to eliminate sliding movement of said joint relative to said carriage and said intermediate body member.

4,690,069

SUSPENSION FOR AXLE CONTROL WITH EMPTY CAR SPRING

Elwood H. Willetts, 102 S. Penataquit Ave., Bay Shore, N.Y. 11706

Filed Apr. 25, 1986, Ser. No. 855,990
Int. Cl.[4] B61F *5/30*
U.S. Cl. 105—224.1 **10 Claims**



1. A suspension for the sprung mass of a vehicle such as a railway car and the like which includes at least one axle supporting a pair of wheels at respective ends, the ends being journaled in journal boxes; said suspension comprising torque arm means extending in the longitudinal direction of the car between a journal box and the sprung mass, first means mounting said torque arm means to the journal box for rotation about a center substantially at the vertical center of the axle, second means mounting said torque arm means to said sprung mass for supporting the sprung mass and for rotation about a center above the vertical center of the axle; torsion means in said torque arm means for resisting vertical deflection of the sprung mass, whereby as the sprung mass is deflected, said second mounting means travels through a relative arc and constitutes means for shifting the axle end longitudinally of the car, said torsion means comprises inner and outer hubs, an annular torsionally stressed elastomeric bushing bonded at its inner and outer circumferential surfaces to said inner and outer hubs, respectively, said torque arm means comprising a pair of oppositely, longitudinally extending torque arms, said first mounting means comprising said inner hub secured concentrically to the journal box, inner ends of said pair of torque arms being respectively integral at their inner ends with said hubs, said second mounting means comprising hinge means for mounting the outer end of one of said torque arms for rotation about a shaft centered above the vertical center of the axle, and further comprising shackle means for mounting the outer end of the other of said torque arms for longitudinal movement, empty car spring means, means hinging said empty car spring means to at least one of said torque arms, means mounting said empty car spring means above said second mounting means for supporting the sprung mass, said empty car spring means comprising second torsion means of less resistance than said first mentioned torsion means and stop means depending from the sprung mass for supporting the sprung mass on said second mounting means as the sprung mass becomes loaded and said empty car spring means is deflected downwardly.

4,690,070

HATCH COVER STRUCTURE

Roy W. Miller, Highland, Ind., assignor to Pullman Rail Leasing Inc., Chicago, Ill.

Filed Jan. 15, 1986, Ser. No. 819,198
Int. Cl.[4] B61D *39/00*; B65D *45/28*
U.S. Cl. 105—377 **30 Claims**

29. A hatch cover arrangement pivotally connected with the top of a railway car and comprising:

a hold-down bar means having a first portion pivotally connected with the top of the railway car;

the railway car having an opening therein generally adjacent the first portion of the hold-down bar means;

a cover adapted to cover the opening;

the hold-down bar means extending above the cover and having a second portion having securing means connecting with the car for securing the hold-down bar means against pivoting away from the opening;

the cover having a forward end portion and a rearward end portion;

the hold-down bar means having first and second retaining means thereon entrappingly engaging the forward and rearward end portions respectively whereby the hold-down bar means floatingly carries the cover between opened and closed positions of the cover and the hold-down bar means with the forward and rearward end portions of the cover entrained by the first and second retaining means; and

one of the retaining means being selectively movable into entrapping engagement and out of entrapping engagement with the cover;

the cover being free to be moved away from the other of the retaining means and out of entrapping engagement therewith and from the hold down bar means when said one of the retaining means is moved out of entrapping engagement with the cover whereby the cover may be readily removed from the hold-down bar means for replacement of the cover.

4,690,071

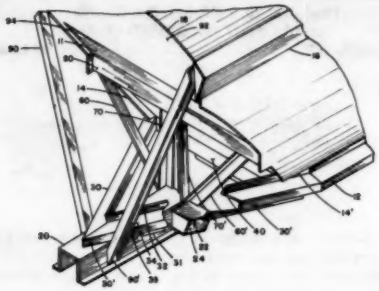
TRUSS END STRUCTURE FOR STUB SILL HOPPER CARS

Robert H. Billingsley, White Oak, Pa., and Steven L. Jantzen, St. Charles, Mo., assignors to ACF Industries, Incorporated, Earth City, Mo.

Continuation of Ser. No. 558,143, Dec. 5, 1983, abandoned. This application Jan. 29, 1986, Ser. No. 828,552
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—404 **6 Claims**

1. In an end structure for a railway car having a car body, a stub center sill located generally along the longitudinal centerline of the car and extending axially at each end of the car body, side sills extending longitudinally along either side of the car body carrying substantially all of the longitudinal train loads from one end of the car to the other, the improvement comprising: a generally horizontal side sill extension at each side of the car extending in an inclined fashion inwardly from the end of each of said side sills to said stub center sill, said side sill extensions comprising the only horizontal load path between said stub center sill and said side sills for carrying horizontal, longitudinal loads between said side sills and said stub center sill; a means extending transversely between the ends of said side sills for carrying transverse compression and tension loads between the ends of said side sills upon horizontal, longi-

tudinal tension and compression loads being applied to said stub center sill; and a truss structure extending upwardly be-



tween the stub center sill and car end for carrying vertical loads and overturning moments between said stub center sill and said car end.

4,690,072

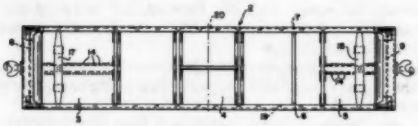
RAILWAY CAR BODY STRUCTURAL ARRANGEMENT

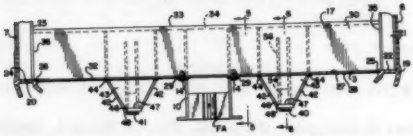
Herbert S. Wille; Phillip G. Przybylinski, both of Schererville, Ind., and Joe B. Raidt, Lansing, Ill., assignors to Pullman Standard Inc., Chicago, Ill.

Filed Apr. 5, 1984, Ser. No. 597,125

Int. Cl.[4] B61D *17/00, 7/00, 3/00*

U.S. Cl. 105—406.1 **24 Claims**





9. A railway car body having:

a center sill having an upper surface

said center sill being a stub center sill;

a bottom closure member having an upper surface and a lower surface, said lower surface of said bottom closure member engaging the upper surface of the center sill;

said upper surface defining a cargo engaging surface;

said bottom closure member having two sides laterally outwardly spaced from said center sill;

a pair of side sill members, each engaging and fixedly connected with a respective side of the bottom closure member and having a pair of opposing longitudinal ends;

said bottom closure member serving as a shear plate member for beaming draft and buff force loadings to the sides of the bottom closure member;

a pair of side wall members each connected with a respective side sill member and extending upwardly therefrom;

the side wall members, the side sill members, and the bottom closure member defining a cargo carrying space therebetween;

a pair of bolster post members each supported adjacent the bottom closure member and fixedly connected with a respective side sill member intermediate the longitudinal ends thereof and connected with a respective side wall member for receiving loads therefrom; and

a body bolster extending transversely with respect to said center sill and extending between said bolster post members;

said bolster being fixedly engaged with said upper surface of said bottom closure member and with said bolster post members;

the bolster comprising:

a pair of bolster side plate members continuously extending from one of said sides of said bottom closure member to the other of said sides of said member;

each of said bolster side plate members having a lower edge portion rigidly engaged with said upper surface of said bottom closure member and each of said bolster side plate members having an upper edge portion; and

a top plate member being rigidly affixed to said side plate members adjacent said upper edge portion of each of said side plate members and forming a beam with said plate members and said bottom closure member for transmitting loads inwardly from the bolster post members; and

each of said side plate members and said top plate member having end portions, said bolster post members being located outwardly of the end portions of the side and top plate members, said end portions abutting and rigidly affixed to the bolster post members to securely connect the bolster post members to the bolster for transferring loads therebetween.

4,690,073

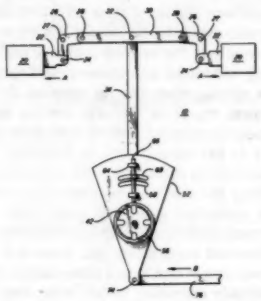
LOCKING MECHANISM

James D. Shoop, Stark County, Ohio, assignor to Diebold, Incorporated, Canton, Ohio

Filed Jul. 23, 1986, Ser. No. 888,919

Int. Cl.[4] E05G *1/04;* **E05B** *13/10*

U.S. Cl. 109—59 T **16 Claims**



1. Apparatus for selectively engaging an external handle associated with a door to a movable bolt for securing said door in a jamb, according to a condition of locking means associated with said door, said locking means settable between locked and unlocked conditions and controlling movement of a pin, said pin having a first position corresponding to said locked condition and a second position corresponding to said unlocked condition, said apparatus comprising:

means for holding said pin on a path between said first position and said second position;

a housing;

first slot means in said housing extending in a first direction for accepting said pin, said first slot means enabling movement of said pin between said first and second positions;

second slot means in said housing for accepting said pin, said second slot means intersecting with said first slot means at

an intersection and extending therefrom in a second direction;

mounting means mounting said housing for movement of said door, said mounting means enabling movement of said housing opposite said second direction and transverse to said first direction when the pin is in the second slot means;

a probe mounted for movement on said housing, said probe being movable between a first condition and a second condition;

probe connecting means for connecting the probe and the pin such that movement of said pin between said first and second positions moves said probe between said first and second conditions respectively;

a moving member, said member including probe engaging means for engaging said probe, said housing and said member movable together for said second condition of said probe;

handle connecting means for connecting said moving member and said handle; and

bolt connecting means for connecting said housing and said bolt, whereby said bolt is moved in response to movement of said housing.

4,690,074

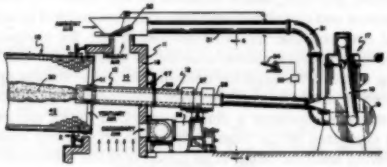
COAL COMBUSTION SYSTEM

Charles L. Norton, 8669 White Oak Ave., Munster, Ind. 46321

Filed May 2, 1986, Ser. No. 859,138

Int. Cl.[4] F23D *1/02*

U.S. Cl. 110—264 **6 Claims**



1. A coal combustiom system comprising:

a combustion chamber;

an elongated burner pipe assembly having an inlet end and an exit end, said exit end being adapted to emit finely divided ooal and combustion air into said combustion

said burner pipe being divided longitudinally into at least two conduits including a central conduit and a concentric first outer annular conduit,

the outlet end of said first annular conduit zone being equipped with spinner means for imparting turbulence to an airstream passing therethrough,

said spinner means comprising a plurality of vanes adjacent the exit end of said first annular conduit, and arranged at an oblique angle to the direction of airflow therein.

said vanes being arranged in two sets, a first set within said first annular conduit and a second set downstream of the first set and beyond the exit end of said central conduit, the vanes of said second set being attached at their outer edges to said second annular conduit and projecting radially inwardly.

the vanes of said second set being fewer in number than the vanes of said first set and being arranged at an oblique angle which is larger than the oblique angle at which the vanes of said first set are arranged.

the inner edges of the vanes of said second set falling on a projected cylinder having a cross-sectional area larger than the cross-sectional area of said central conduit.

means for supplying finely divided coal suspended in a first stream of air to the inlet end of said central conduit;

means for supplying a second stream of air to the inlet end of said first annular conduit; and

means for heating said second stream of air.

4,690,075

IGNITION AND COMBUSTION SUPPORTING BURNER FOR PULVERIZED SOLID FOSSIL FUEL AND COMBUSTION CHAMBER COMPRISING SAME

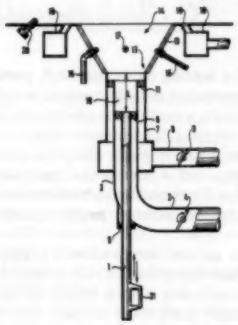
Jean Vidal, Ville d'Avray; Francois Malaubier, Le Plessis Robinson, and Jean-Claude Mevel, Les Ulis, all of France, assignors to Stein Industrie, Velizy Villacoublay, France

Continuation of Ser. No. 766,375, abandoned. This application Aug. 4, 1986, Ser. No. 891,429

Claims priority, application France, Aug. 16, 1984, 84 12855

Int. Cl.[4] F23D *1/02*

U.S. Cl. 110—264 **2 Claims**



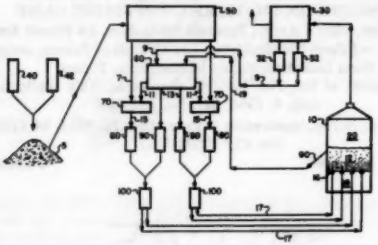
1. Ignition and combustion supporting burner for pulverized solid fossil fuel, comprising an axial conduit (1) for feeding pulverized solid fuel in a primary combustion supporting gas, a refractory tap-hole (12) coaxially of said axial conduit having an inlet and a shape which confines the initial part of the flame, a premix chamber (10) between the end of said axial conduit and the inlet of said tap-hole for preliminary mixing of said fuel and a part of a secondary combustion supporting gas, a first annular conduit (2) feeding a part of a secondary combustion supporting gas, rotation inducing vanes (6) around the end of said axial conduit and within said first annular conduit for creating turbulence in the flow of said secondary combustion supporting gas within said first annular conduit, a second annular conduit (7) concentric about said first annular conduit (2) feeding another part of said secondary combustion supporting gas, rotation inducing vanes (11) at the end of said first annular conduit and within said second annular conduit for creating turbulence in the flow of said another part of said secondary combustion supporting gas, means (4, 9), separate from said rotation inducing vanes (6, 11) for independently adjusting the respective flowrates of said secondary combustion supporting gas in said first and second annular conduits respectively, a conduit (19) for feeding a tertiary combustion supporting gas concentric with said tap-hole and at least partially surrounding it, adapted to be supplied with a sufficient flowrate of a tertiary combustion supporting gas and acting, in conjunction with flowrates of said primary and secondary combustion supporting gas, to produce total combustion of said pulverized solid fossil fuel, a flame detector device (20), an igniter (15) disposed in one of said refractory tap-hole and said axial conduit, and translation means (21) for shifting said axial conduit axially within said first annular conduit (2) whereby the length of said premix chamber may be adjusted.

4,690,076

METHOD FOR DRYING COAL WITH HOT RECYCLE MATERIAL

Lawrence J. Peletz, Jr., East Granby, and Glen D. Jukkola, Glastonbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 4, 1986, Ser. No. 848,065
Int. Cl.[4] F22B *1/00*
U.S. Cl. 110—347 3 Claims



1. A method for feeding particulate fuel, particulate sulfur absorbant, and particulate recycle material to a fluidized bed furnace system having a combustion chamber housing a bed of said particulates wherein the particulate fuel is combusted to produce hot gases, a flue through which the gases are vented to the atmosphere, and a mechanical particulate collector disposed in the flue for removing particulates entrained in the gases prior to venting the gases to the atmosphere, said method comprising:

a. premixing at ambient temperature a supply of wet raw particulate fuel comprising crushed raw sulfur-bearing coal to be combusted with a supply of raw particulate sulfur absorbent comprising crushed raw limestones to form a flowable mixture thereof, the crushed raw sulfur-bearing coal and the crushed raw limestone being selectively premixed to provide a calcium to sulfur mole ratio ranging from about 50% to about 90% of the desired overall calcium to sulfur mole ratio;

b. blending the mixture of wet raw particulate fuel and raw particulate sulfur absorbent in a first mixing apparatus with a first portion of hot particulate recycle material withdrawn from the fluidized bed furnace system at a temperature ranging from about 400 F. to about 700 F. at a controlled rate so as to contact the wet raw particulate coal with the hot particulate recycle material at a ratio ranging from 0.1 to about 1.0 pounds of hot particulate material per pound of particulate fuel thereby substantially drying the wet raw particulate coal;

c. monitoring the temperature of the resultant mixture of dried raw crushed coal, raw crushed limestone, and cooled particulate recycle material leaving the first mixing apparatus;

d. selectively adjusting the controlled rate at which the first portion of the hot particulate material is blended with the mixture of wet raw crushed coal and raw crushed limestone so as to maintain the temperature of the resultant mixture within a preselected temperature range;

e. blending a second portion of the hot particulate recycle material withdrawn from the fluidized bed furnace system in a second mixing apparatus with the resultant mixture of dried raw crushed coal, raw crushed limestone, and cooled particulate recycle material after leaving the first mixing apparatus; and

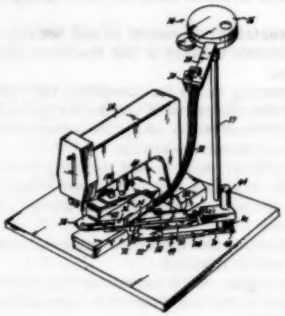
f. entraining the mixture of dried raw particulate coal, raw particulate sulfur absorbent and particulate recycle material withdrawn from the fluidized bed furnace system in a conveying gas for introduction into the conbustion chamber of the fluidized bed furnace system.

4,690,077

BUTTON DELIVERY SYSTEM FOR SEWING MACHINES

Morris Nirenberg, 480 Golf Ct., North Woodmere, N.Y. 11581

Filed Jun. 6, 1986, Ser. No. 872,085
Int. Cl.[4] D05B *3/22*
U.S. Cl. 112—113 14 Claims



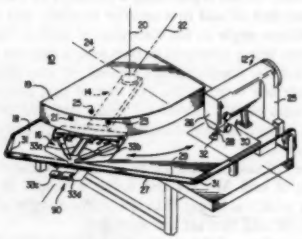
1. In a button feeding mechanism for feeding buttons to a clamp on a raised arch of a sewing machine wherein the button feeding mechanism comprises a frame, driving means mounted on said frame, a first rod mounted on said frame for reciprocal movement and having an initial position, coupling means for coupling said driving means to said first rod selectively to move said first rod from its initial position through a cycle of movement, orienting means mounted on said frame for orienting a button and coupled to said first rod, a second rod coupled to said first rod and mounted on said frame for reciprocal motion, and moving means coupled to said second rod for moving a button through the orienting means to the clamp of said sewing machine, the improvement comprises said coupling means comprising a clutch controlled by an electrical circuit energized by the simultaneous condition of the arch of said sewing machine being in its raised position subsequent to being in its lowered position and said first rod being in its initial position.

4,690,078

METHOD AND APPARATUS FOR FORMING AND STITCHING A SHIRT PLACKET

Joseph W. A. Off, Irving, and Vivian Ferguson, Dallas, both of Tex., assignors to Automated Machinery Systems, Richmond, Va.

Filed Sep. 19, 1986, Ser. No. 909,693
Int. Cl.[4] D05B *21/00*; A41H *33/00*
U.S. Cl. 112—121.12 12 Claims



1. An apparatus for folding and stitching a placket, comprising:

a base having a pivot axis and first and second longitudinal axes located in the plane of the base and intersecting the

pivot axis, the second longitudinal axis offset from the first longitudinal axis by a predetermined angle;

a sewing machine mounted on the base and having means for clamping and stitching a placket;

a transfer arm assembly having a first end and a second end, the first end attached to the base at the pivot axis;

a placket forming assembly supported on the second end of the transfer arm assembly for receiving a workpiece to be formed into a placket while the transfer arm assembly is located along the first longitudinal axis;

means supported by the base for rotating the transfer arm assembly and the workpiece about the pivot axis following formation of the placket between the first longitudinal axis and the second longitudinal axis to locate the placket along the second longitudinal axis;

means responsive to the rotating means for actuating the clamping and stitching means of the sewing machine to stitch the placket;

a clamping assembly supported on the second end of the transfer arm assembly for clamping the workpiece prior to rotating the transfer arm assembly;

a control switch for actuating the clamping assembly to clamp the placket in the transfer arm assembly; and

means responsive to the control switch for extending the placket forming assembly between a retracted position and an extended position along the first longitudinal axis to facilitate formation of the placket.

4,690,079

OVEREDGE WIDTH REGULATING DEVICE FOR OVEREDGING SEWING MACHINES

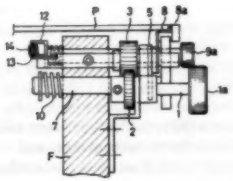
Shiro Satoma, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Dec. 23, 1986, Ser. No. 945,664

Claims priority, application Japan, Dec. 28, 1985, 60-298667

Int. Cl.[4] D05B *1/20*

U.S. Cl. 112—162 **2 Claims**



1. In an overedging sewing machine capable of adjusting overedge width by moving an overedge-width latch and a lower knife, both adjacently located near the needle holes of said machine, in a direction crossing to the feeding direction of a workpiece, an overedge width regulating device comprising: a movable piece which moves along a plurality of shafts in a direction crossing the feeding direction of said workpiece; an overedge-width latch arranged on one of said plurality of shafts which is adapted to move in a direction crossing the feeding direction of said workpiece; a lower knife arranged on one of said plurality of shafts which moves simultaneously with said movable piece and in the same direction as said movable piece; a switching means located on one of said plurality of shafts for releasing and returning said overedge-width latch to its original position; and adjusting means located on one of said plurality of shafts for moving said movable piece back and forth by rotating a knob located on one of said plurality of shafts.

4,690,080

OVEREDGE SEWING MACHINE

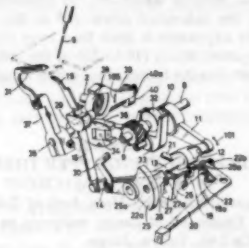
Yoshio Mikuni, Osaka, and Osamu Koshinaka, Izumi, both of Japan, assignors to Maruzen Sewing Machine Co., Ltd., Osaka, Japan

Filed Jul. 15, 1986, Ser. No. 885,698

Claims priority, application Japan, Jul. 15, 1985, 60-156826

Int. Cl.[4] D05B *1/20, 57/06*

U.S. Cl. 112—162 **16 Claims**



1. An overedge sewing machine wherein with movements given from a main shaft which is driven for rotation, a needle is substantially vertically moved and an upper looper is substantially vertically moved in the direction which crosses the fabric feed direction and a lower looper is swung in the direction crossing the fabric feed direction, the cooperating action of said needle and said upper and lower loopers performing three thread overedge stitching, said overedge sewing machine being characterized in that it comprises:

means for selectively stopping the substantially vertical movement of said upper looper; and

means for applying reciprocating movement in the fabric feed direction to said lower looper with the timing agreeing with the substantially vertical movement of said needle.

4,690,081

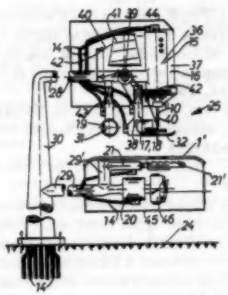
SEWING MACHINE

Wolfgang Castagna; Jochen Krankenhagen; Heinz Ortwein, and Klaus Weertz, all of Berlin, Fed. Rep. of Germany, assignors to awfi Arbeitswissenschaffliches Forschungsinstitut GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 522,840, Aug. 12, 1983, abandoned. This application Dec. 13, 1985, Ser. No. 808,518

Int. Cl.[4] D05B *69/08*

U.S. Cl. 112—276 **2 Claims**



1. A sewing device having a sewing head with thread tensioner, a presser foot, an underthread roller with a looper for guiding the underthread, transport means for the advancing of

the workpiece to be handled and a plurality of drives, characterized in that:

(a) each individual element has its separate drive (**15** to **23**) in the form of hydromotors or hydropistons;

(b) the separate drives (**15** to **23**) are connected via lines (**14**) with a hydraulic pulse generator (**11**) driven by an electric or hydraulic motor (**12**) and can be controlled synchronously by said generator;

(c) the hydraulic stream (**13**) which is continously fed to the pulse generator (**11**) is transformed into a plurality of hydraulic streams which are fed separately, via the lines (**14**), to the individual drives (**15** to **23**), pulsate and are infinitely adjustable in their frequency range; and

(d) the separate drives (**15** to **23**) of the individual elements are adapted to the forces of speeds to be transmitted by the latter.

4,690,082

DEVICE FOR REGULATING UPPER THREAD TENSION OF A SEWING MACHINE

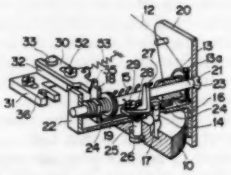
Yasukata Eguchi; Kazumasa Hara, both of Tokyo, and Michio Hisatai ., Fujino, all of Japan, assignors to Janome Sewing Machine Co Ltd., Tokyo, Japan

Filed Nov. 7, 1985, Ser. No. 796,392

Claims priority, application Japan, Nov. 9, 1984, 59-234900

Int. Cl.⁴ D05B *47/04*

U.S. Cl. 112—254 **7 Claims**



1. A device for regulating upper thread tension in a sewing machine having an upper thread tension device with two discs receiving an upper thread therebetween, a spring pressing the discs one against the other, a presser body positioned between said spring and said discs, and a manually operated dial for actuating said presser body, the regulating device comprising an indicator for indicating a thread tension of a proper value and operatively connected to said dial and movable thereby, and a regulating means for regulating a relation between a moving amount of said presser body and a moving amount of said indicator and adjusting a pressure of a thread tension to the movement of the thread tension indicator.

4,690,083

AUTOMATIC UPPER THREAD TENSION CONTROL FOR A SEWING MACHINE

Kazumasa Hara; Mikio Koike, both of Tokyo, and Akiyoshi Sasano, Musashino, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Nov. 12, 1985, Ser. No. 797,418

Claims priority, application Japan, Nov. 9, 1984, 59-236088; Nov. 20, 1984, 59-243253

Int. Cl.⁴ D05B *47/04*

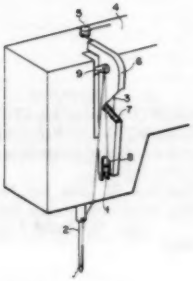
U.S. Cl. 112—254 **8 Claims**

1. An automatic thread tension adjusting device on a sewing machine that includes an upper drive shaft rotatable to vertically reciprocate a swingable needle to penetrate a fabric to be sewn and also to reciprocate a thread take-up lever to supply an upper thread from a supply means to the needle and tighten a stitch to be formed and includes a loop taker rotatable in association with the upper drive shaft to catch the upper thread for interlocking the upper thread with a lower thread to form the stitch, the upper thread being extended between an upper thread supply and the needle and through at least the thread takeup lever, said automatic thread tension adjusting device comprising:

(a) thread tension means (**14**) provided between said upper thread supply and said thread take-up lever, said thread tension means guiding said upper thread and normally giving a predetermined constant tension to said upper thread;

(b) cushion spring means (**1**) provided between said thread tension means and said thread take-up lever, said cushion spring means absorbing a surplus of thread between said thread tension means and said thread take-up lever, said surplus thread resulting from the difference between an upper thread amount required by said loop taker and an upper thread amount supplied by said thread take-up lever, said cushion spring means having an elastic force greater than the tension of said thread tension means (**14**) and movable in a predetermined range to absorb said surplus upper thread;

(c) first means (**12**) provided between said thread tension means and said cushion spring and being activable to hold said upper thread between said thread tension means and said cushion spring means;



(d) second means (**13**) provided between said cushion spring means and said thread take-up lever and being activable to hold said upper thread between said cushion spring means and said thread take-up lever;

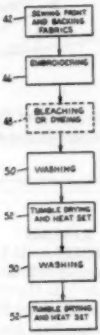
(e) first sensor means (**34**), (**35**) operable in association with the rotation of said upper drive shaft for giving a first signal at a first angular position θ_2 of said upper drive shaft while said first thread holding means (**12**) is activable to hold said upper thread, said first signal activating said second thread holding means (**13**) to hold said upper thread; and

(f) second sensor means (**30**, **31**) operable in association with the rotation of said upper drive shaft to give a second signal at a second angular position θ_3 of said upper drive shaft, said second signal inactivating said first thread holding means (**12**) to release said upper thread, said second sensor means producing a third signal at a third angular position θ_4 of said upper drive shaft, said third signal activating said first thread holding means (**12**) to hold said upper thread and simultaneously inactivating said second thread holding means (**13**) to release said upper thread, such that said surplus upper thread is supplied to said fabric to be sewn.

4,690,084
PRODUCTION OF PUFFED EMBROIDERED DESIGN FABRICS

David Krieger, Greenville, S.C., assignor to Krieger Corporation, Travelers Rest, S.C.

Filed Dec. 20, 1985, Ser. No. 811,780
Int. Cl.[4] D05C 17/00; D06C 23/04
U.S. Cl. 112—266.1 6 Claims



1. A method of producing a stabilized puffed embroidered design fabric which may have included on its face any one of a wide variety of designs patterned by embroidery comprising:

providing a front fabric consisting of warp and weft yarns woven in a generally closed mesh;

providing a separate lightweight back fabric consisting of warp and weft yarns woven in a loosely woven open mesh having a substantially larger open mesh than the generally closed mesh of said front fabric, and selecting said back fabric to have warp and weft yarns of up about 20% higher shrinkage than the yarns of said front fabric;

uniting said front and back fabrics in a composite fabric by embroidering a prescribed preshrink embroidered pattern on said front fabric formed by a first shrinkable embroidery thread on the face of said front fabric interlocked with a second shrinkable thread on the backside of said back fabric;

subjecting said embroidered composite panel to hot water treatment in a manner and temperature that said back fabric shrinks relative to said front fabric causing excess in said front fabric within said emboidery stitches to puff up and form puffed design elements in said preshrunk embroidered pattern creating a puffed embroidered design on the face of said front fabric after shrinking; the shrinkage of said embroidery threads enhancing the puffing of the design and

drying said embroidered composite panel in a relaxed, untensioned state in a manner that said puffed design elements and puffed embroidered design are stabilized in said front fabric.

4,690,085
PROPULSION SYSTEM FOR A TORPEDO WITH THRUST COMPENSATION

Daniel R. Dobbs, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 9, 1986, Ser. No. 883,634
Int. Cl.[4] F16C 35/06, 33/74
U.S. Cl. 114—20.2 10 Claims

1. In a propulsion system, the combination of:

a frame;

a rotatable propeller on said frame;

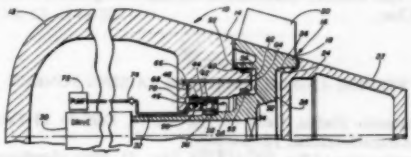
a drive on said frame and connected to said propeller;

a bearing jurnalling said propeller for rotation about an axis;

a first piston mounting said bearing on said frame for movement along said axis;

a first cylinder on said frame receiving said piston;

a second piston on said frame;



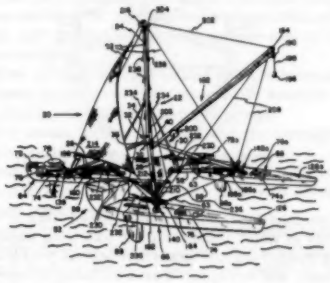
a second cylinder on said propeller opening oppositely of said first cylinder and receiving said second piston; and

means placing said cylinders in fluid communication with each other.

4,690,086
WATER SAILING CRAFT

Quentin M. McKenna, P.O. Box 512, Waimanalo, Hi. 96795

Filed Jan. 28, 1985, Ser. No. 695,696
Int. Cl.[4] B63B 1/14
U.S. Cl. 114—39 8 Claims



1. In a watercraft, the combination comprising:

a plurality of spaced-apart flotation members;

a plurality of elongate spar members having opposite proximal and distal ends, each of said elongate spar members corresponding to one of said flotation members;

a generally vertical spar member having opposite proximal and distal ends;

a juncture means for receiving the proximal ends of each of said elongate spar members and said vertical spar member; and

a plurality of spar attachment means each for connecting the distal end of one of said elongate spar members to its corresponding flotation member, each of said spar attachment means including

an elongate mounting bracket attached to the distal end of its corresponding elongate spar member, said mounting bracket having a connection portion defining an aperture therein, and

a mounting assembly attached to its corresponding flotation member, said mounting assembly having an upstanding fastener which extends through said aperture and a coupling member received about said upstanding fastener having a lower reduced diameter portion extending through said aperture between said fastener and said connection portion of said mounting bracket in spaced relation thereto so as to connect said corresponding spar member to its corresponding flotation member and permit said corresponding spar member to move omni-directionally relative thereto, said coupling member having an

upper enlarged diameter portion which overlies said connection portion of said mounting bracket and has a diameter greater than the diameter of said aperture so as to limit the omni-directional movement of said corresponding spar member relative to its corresponding flotation member.

4,690,087

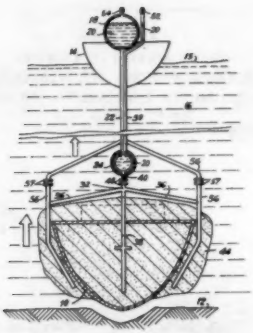
SYSTEM AND METHOD FOR RAISING SUNKEN VESSELS

Constantin Hadjis, Calle 84 No. 2A/14, Edificio El Cerro, Maracaibo(Zulia), Venezuela

Continuation of Ser. No. 842,504, Mar. 21, 1986, abandoned, which is a continuation of Ser. No. 778,631, Sep. 20, 1985, abandoned, which is a continuation of Ser. No. 625,279, Jun. 27, 1984, abandoned. This application Aug. 7, 1986, Ser. No. 894,162

Int. Cl.[4] B63C *7/06*

U.S. Cl. 114—50 **14 Claims**



1. A method for raising a sunken vessel lying at the bottom of a body of water, comprising the following steps:

positioning cryogenic means in relationship with said sunken vessel, said cryogenic means including a liquefied cryogenic fluid in the vicinity of the vessel for delivery of the fluid to the vessel, and

distributing said fluid the length of the vessel within cryogenic piping held in close proximity to the vessel, and

directing said fluid through cryogenic pipes of said piping which are shaped for delivering said fluid to the lower outside of the vessel that is close to the bottom's surface, with minimum penetration of said bottom surface, with

releasing for vaporization, said liquefied cryogenic fluid around said sunken vessel along its length in sufficient quantity so that a sufficient volume of water is formed into an ice mass integral with and encapsulating a sufficient portion of the length of said sunken vessel so that the vessel is raised to the surface of the water by the force of the buoyancy of the ice.

4,690,088

SAIL RIGGING WITH FAIRING

Fabio Perini, Via Fornace, 55100 San Michele di Moriano, Lucca, Italy

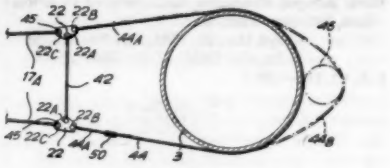
Filed Jul. 14, 1986, Ser. No. 885,559

Claims priority, application Italy, Jul. 23, 1985, 9460 A/85

Int. Cl.[4] B63H *9/06, 9/08*

U.S. Cl. 114—102 **8 Claims**

1. A sail of improved aerodynamic efficiency for a sailboat having a mast and a boom, said sail including a spanker portion and a fairing portion interconnected by a stay, said fairing portion having trailing edges, the leading edge of the spanker portion being bifurcated and disposed in said stay so that each portion of said bifurcated edge is in alignment with a trailing edge of said fairing, said stay includes at least two seperate portions, each having channels therein, and wherein the leading edges of the bifurcated portion of the sail and the trailing



edges of the fairing all have footropes disposed and arranged to lie within a juxtaposed channel in the adjacent stay portion.

4,690,089

BOAT WITH A RAISABLE AND LOWERABLE KEEL

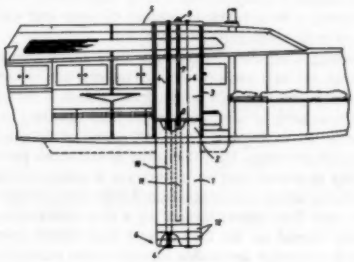
Fritz Marggraff, Schwanenstieg 1, 7750 Konstanz 16, Fed. Rep. of Germany

Filed Jan. 21, 1986, Ser. No. 821,077

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1985, 3501892; Apr. 26, 1985, 3515090

Int. Cl.[4] B63B *41/00*

U.S. Cl. 114—141 **4 Claims**



1. A boat having a movable lifting keel guided in a lifting keel box, said lifting keel having a top and a bottom and being provided with a plurality of channels extending from said top toward said bottom, compression springs positioned in said plurality of channels such that one end of said compression springs presses against a lower stop connected to said boat and the other end presses against an upper stop connected to said lifting keel, and a plurality of rods connected to said boat and passing through said compressing springs, said rods having on their lower ends a plate forming said lower stop.

4,690,090

CLEAT AND DEVICE THEREFOR

William E. Tuttle, 843 SE. St. Lucie Blvd., Stuart, Fla. 33494

Filed Oct. 28, 1986, Ser. No. 923,916

Int. Cl.[4] B63B *21/04*

U.S. Cl. 114—218 **9 Claims**

6. A device for improving the line snagging properties of a conventional deck cleat, comprising a continuous length of wire, said wire being bent to comprise a first and a second oppositely extending, downwardly sloping open loops, said loops comprising an inner width substantially equal to an outer width of said cleath, the wire of said first loop comprising a portion extending upwardly, thereby, upon said device being

clamped to said cleat, combining with a top surface of said cleat to form a wedge-shaped opening for snagging a line, and

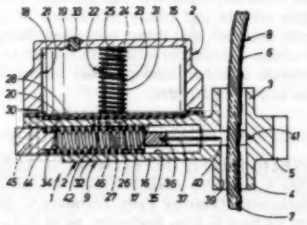
said loops combining with tapered portions of said cleat to form wedge-shaped openings for snagging a line.

4,690,091

SECURING ARRANGEMENT SO EXECUTED AS TO BE TRIPPED ON ACTUATION

Sven-Erik Persbeck, Torslanda, Sweden, assignor to Mats Hermansson, Gothenburg, Sweden

Filed Mar. 18, 1986, Ser. No. 840,668
Claims priority, application Sweden, Mar. 18, 1985, 8501305
Int. Cl.[4] B63B *9/00*
U.S. Cl. 114—221 A **2 Claims**



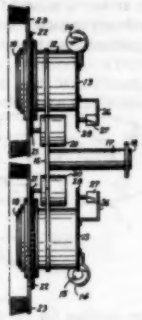
1. Securing device connected to a loadable link for attaching an item of equipment to a construction, the device being operable to open the link to release the equipment by being actuated by a change in pressure in the water surrounding the device, which device comprises a channel for the link, which link is in the form of a cable, guide means transverse to the channel, blade means having a sharp edge slidable in the guide means between a first position adjacent to the channel and a second position across the channel, spring means for moving the blade means from its first to its second position, locking means having a locked position for holding the blade means in its first position and an unlocked position for leaving the blade means free to be moved by means of the spring means, a pressure chamber, a movable element in the pressure chamber subject to the influence of the pressure in the chamber, second spring means for pressing the element into the chamber with a predetermined force, connecting means between the element and the locking means for holding the locking means in its locked position when the second spring means is biasing the element to be in an inner position in the chamber and for bringing the locking means to its unlocked position in order to release the blade means when the element is pressed outwards from the chamber from its inner position by means of a predetermined pressure level in the chamber, the second spring means being adjustable to allow the element to be moved from its inner position by the reaching of the predetermined pressure level in the chamber.

4,690,092

AQUATIC SCRUBBING DEVICE

Milton Rabuse, 249-32 57th Ave., Little Neck, N.Y. 11362

Filed Jun. 5, 1986, Ser. No. 871,452
Int. Cl.[4] B63B *59/00*
U.S. Cl. 114—222 **4 Claims**



1. An aquatic scrubbing device for attachment to a ferromagnetic surface, comprising:

(1) a first electromagnet having a longitudinal axis;

(2) a second electromagnet having a longitudinal axis spaced from and parallel to the longitudinal axis of said first electromagnet;

(3) a first carriage interconnecting said electromagnets and supporting each said electromagnet for rotation about its longitudinal axis relative to said carriage;

(4) drive means for rotating each said electromagnet about its longitudinal axis;

(5) control means for selectively energizing said electromagnets and their associated drive means in repetitive sequence comprising:

(a) energization of both said electromagnets to cause said electromagnets to attach to said ferro-magnetic surface, and de-energization of said drive means of both said electromagnets

(b) subsequent de-energization of one of said electromagnets only and energization of the drive means of the other said electromagnet to cause said carriage to move arcuately about the longitudinal axis of said other electromagnet

(c) subsequent de-energization of said drive means of said other electromagnet and energization of both said electromagnets

(d) subsequent de-energization of the said other said electromagnet and energization of the drive means of said one electromagnet to cause said first carriage to move arcuately about the longitudinal axis of said one electromagnet; and,

(6) rotary scrubbing means and associated drive means carried by said device.

4,690,093

OIL-SPILL-COMBATTING WATER CRAFT

Lars Lundin, Porvoo, Finland, assignor to Oy Lars Lundin Patent AB, Helsinki, Finland

Filed Jun. 3, 1986, Ser. No. 870,211
Claims priority, application Finland, Jun. 4, 1985, 852238
Int. Cl.[4] B63B *35/00*
U.S. Cl. 114—270 **4 Claims**

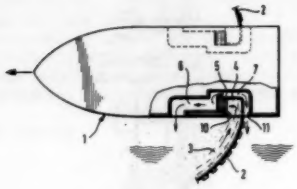
1. In an oil-spill-combatting water craft for recovering oil present on the surface of water, in which said water craft has at least one inlet for oil-contaminated water positioned in the side of the water craft hull, comprising:

a collecting boom partly submerged into the water and secured to said hull side immediately behind the inlet for

oil-contaminated water, said boom extending outwardly and forwardly with respect to the travel of the water craft so as to collect and guide oil-contaminated water into said inlet;

a flow conduit arranged inside the water craft and being directly connected to said inlet;

separating means arranged in said flow conduit to separate oil from the oil-contaminated water entering the water craft through said inlet; and



at least one outlet opening for the discharge of water from which oil has been separated, and

said outlet opening positioned in the hull immediately behind the collecting boom, said outlet opening discharging at least a portion of the water, from which oil has been separated, immediately at the rear side of the collecting boom.

4,690,094

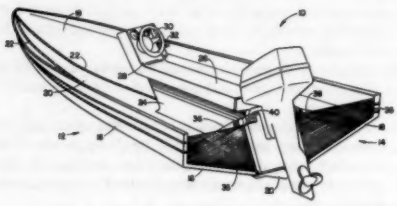
BOAT WITH CHANGEABLE CONFIGURATION HULL

James F. Taylor, 4217 Laurel Ridge Dr., Raleigh, N.C. 27612

Filed Mar. 31, 1986, Ser. No. 845,939

Int. Cl.[4] B63B *1/22*

U.S. Cl. 114—284 **18 Claims**



1. A boat with a variable configuration hull comprising: a hull structure having moveable hull section means moveable between a first position and a second position; drive means for moving said boat through the water; hull configuration control means operatively connected between said drive means and said hull section means for moving said moveable hull section means between said first and second positions; said boat further including mounting means, for supporting said drive means, pivotally secured to said hull structure and moveable between a first position and a second position; and wherein said control means includes connecting arm means secured at one end to said mounting means and at the other end to said moveable hull section means such that when said mounting means is moved from said first position to said second position said hull section means will also be moved from said first position to said second position.

4,690,095

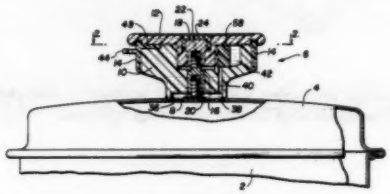
COOKING AND WHISTLING KNOB THEREFOR

Henry M. Walls, Pittsburgh, and George M. Sayers, Jr., Clearfield, both of Pa., assignors to TSCO Corporation, Hickory, Pa.

Continuation of Ser. No. 512,072, Jul. 8, 1983, abandoned. This application May 19, 1986, Ser. No. 865,949

Int. Cl.[4] A47J *27/212*; G08B *3/00*

U.S. Cl. 116—67 R **22 Claims**



1. A whistling knob for a cooking vessel,

said knob having a body with a surface for engaging a wall of a cooking vessel,

a whistle chamber in said knob, said whistle chamber having an axis,

passage means formed in said knob and extending from said surface and has a convergent portion with a planar bottom to said whistle chamber, said passage means being oriented to introduce steam into said whistle chamber at an angle from an inlet normal to said planar bottom and in direct communication with said passage, which causes an audible whistle and rotary movement of steam in the whistle chamber, said rotary movement being in a direction which is circumferential with respect to said axis,

said whistle chamber having outlet means for releasing steam to the atmosphere.

4,690,096

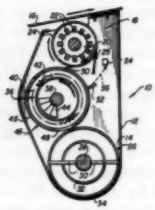
MAGNETIC BRUSH DEVELOPMENT APPARATUS HAVING A GATING AND METERING MECHANISM

Frank Hacknauer, Honeoye Falls; Salvatore C. DeFazio, Bergen, and Richard S. Fox, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,895

Int. Cl.[4] G03G *15/09*

U.S. Cl. 118—657 **5 Claims**



1. In a magnetic brush development apparatus for applying developer material to a latent image on a photoconductor, the apparatus having a housing with a sump for holding a supply of developer material, a magnetic brush for applying developer material to the latent image, a rotatable transport roller between the sump and the magnetic brush, and a magnet in the roller for attracting developer material from the sump to the roller, the improvement comprising:

a gating and matering mechanism for controlling the flow of developer material to the magnetic brush, the mechanism comprising a gating member positioned around at least part of the transport roller and having first and second

spaced openings, and means for moving the gating member relative to the roller between

(1) a first position wherein (a) the first opening is located relative to the roller and the magnetic brush to permit flow of developer material from the roller through the first opening to the magnetic brush and (b) the second opening is located relative to the sump and the magnet to permit flow of developer material from the sump through the second opening to the roller, and

(2) a second position wherein the openings are offset from the sump and the magnetic brush to block the transport of developer material from the sump to the magnetic brush by the roller.

4,690,097

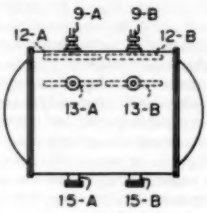
APPARATUS AND METHOD FOR PLASMA TREATMENT OF RESIN MATERIAL

Kenji Fukuta; Takaoki Kaneko, and Yoshinobu Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Continuation of Ser. No. 583,270, Feb. 4, 1984, abandoned. This application Nov. 17, 1986, Ser. No. 931,012

Int. Cl.⁴ B01J *19/08*

U.S. Cl. 118—723 **1 Claim**



1. An apparatus for irradiating resinous work pieces with plasma which comprises:

a vacuum reaction chamber having an inner continuous side wall closed at both ends to provide a work receiving space with a cross sectional area having distance between diametrically opposed points on said wall of at least 1000 mm;

means for mounting work pieces within said chamber;

a plurality of plasma introducing ports extending through said side wall and spaced circumferentially about said wall in spaced increments;

a plurality of pipes individually extending longitudinally of said chamber in proximity to said side wall and adjacent to associated ones of said plurality of introducing ports;

a plurality of manifold means associated with and individually connected to each of said plurality of introducing ports, each manifold means having a number of conduits running from each of said plurality of introducing ports to each of said associated ones of said plurality of pipes;

each of said plurality of pipes having a plurality of nozzle openings extending along the entire length of each of said plurality of pipes, each of said nozzle openings being circumferentially spaced at angular staggered positions of up to 30° on either side of a reference plane defined by a pair of axes running through the center of each of said plurality of pipes and through an associated one of said plurality of introducing ports;

a plurality of plasma exhaust ports extending through said side wall, each of said plurality of exhaust ports being spaced circumferentially and diametrically opposed to individual ones of said plurality of introducing ports and thereby individually paired with said individual ones of plurality of introducing ports to pass plasma through said reaction chamber, said paired plurality of introducing and exhaust ports being positioned on substantially diametrically opposed points on said side wall; and

means for operating each pair of said paired plurality of introducing and exhaust ports intermittently and at differently timed intervals from said remaining pairs of said plurality of introducing and exhaust ports, thereby uniformly distributing plasma on the work pieces in said reaction chamber.

4,690,098

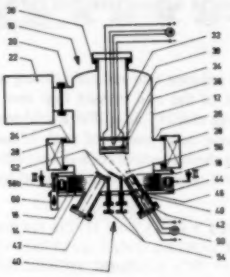
VACUUM VAPOR-DEPOSITION SYSTEM

Horst M. Mertens, Munich, and Leonhard Bögl, Buchbach, both of Fed. Rep. of Germany, assignors to ATOMIKA Technische Physik GmbH, Munich and Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, both of, Fed. Rep. of Germany

Filed Oct. 29, 1985, Ser. No. 792,700

Int. Cl.⁴ C23C *14/26*

U.S. Cl. 118—727 **7 Claims**



1. A vacuum-vapor-deposition system comprising a vacuum-tight vapor-deposition chamber the wall whereof includes a fixed part and a movable part, a substrate-holder adapted to hold at least one substrate to be coated arranged at said fixed part, an evaporation apparatus arranged at said movable part and having at least one heatable vapor-deposition material source, vacuum-tight connecting apparatus adapted to connect said fixed part to said movable part and means to permit a swivel motion, around two nonparallel axes, of the movable part while the fixed part remains stataionary and means coupled to said fixed part and said movable part for producing said swivel motion throughout deposition.

4,690,099

PULSATION ARRANGEMENT

David J. Gregan, and Ronald H. Crowter, both of Hamilton, New Zealand, assignors to The National Dairy Association of N.Z., Auckland, New Zealand

Filed Nov. 27, 1985, Ser. No. 802,261

Claims priority, application New Zealand, Nov. 27, 1984, 210351

Int. Cl.⁴ A01J *5/04*

U.S. Cl. 119—14.41 **7 Claims**

1. A milking machine pulsator arrangement for operating a plurality of milking claws comprising:

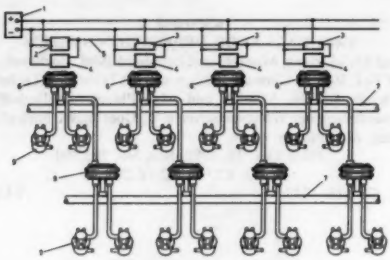
a plurality of pulsator units each of which comprises a valve means operatively connected to a separate milking claw means for controlling alternative application of atmospheric and vacuum pressure to operate each respective milking claw means and a separate electric coil means operatively associated with each respective valve means for individually operating said valve means;

a pulsator rate and ratio timing means operatively associated with a first one of said plurality of pulsator units for operating the coil means of said first one of said units;

time delay means operatively associated with each of the other of said pulsator units for individually operating the respective coil means of each of said other units;

an electric power source; and

electrical conduit means connecting said power source to each of said coil means and connecting said pulsator rate and ratio timing means between said power source and each of said time delay means;



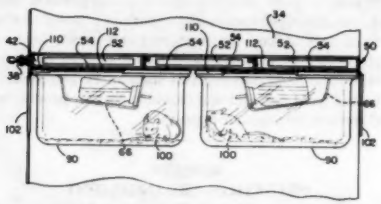
so that said pulsator rate and ratio timing means controls the operation of the coil of said first one of said units and provides an electric pulse after a predetermined time delay to said time delay means of each of said other units for operating the respective coils of said other units in succession after a respective predetermined time delay.

4,690,100

VENTILATED ANIMAL HOUSING AND SERVICE SYSTEM WITH CAGE FILTER COVERS

William R. Thomas, Conyngham, Pa., assignor to Thoren Caging Systems, Inc., Hazleton, Pa.

Filed Oct. 22, 1985, Ser. No. 790,106
Int. Cl.[4] A01K *1/03*
U.S. Cl. 119—15 **12 Claims**



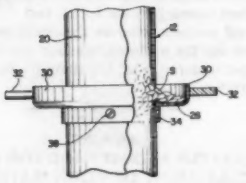
1. An animal housing and maintenance system, comprising:
at least one hollow shelf having at least one internal duct for carrying air, the at least one shelf being affixed to at least one of an air supply and an air exhaust, the at least one shelf having a plurality of spaced air openings on one side thereof, communicating with the at least one duct;
a plurality of hollow cages removably mounted on the at least one shelf, each cage being a solid box with one open wall, the open wall being disposed toward the at least one shelf when the cage is mounted on the shelf, the cage encompassing at least one of said spaced air openings;
means for removably holding the cages in position against the at least one shelf;
a filter panel disposed across each said open wall, the filter panel having a foraminous sheet for enabling air flow and a frame for engaging the cage around a periphery of the open wall, the frame being affixed to the foraminous sheet;
whereby occupants of the cages are pathologically isolated when the cages are held against the at least one shelf and also when the cages are removed form the at least one shelf.

4,690,101

BIRD FEEDER WITH ADJUSTABLE FEED TRAY

Peter Kilham, Mill Rd., Foster, R.I. 02825

Continuation-in-part of Ser. No. 735,220, May 17, 1985, abandoned. This application Jun. 27, 1986, Ser. No. 879,260
Int. Cl.[4] A01K *39/01*
U.S. Cl. 119—52 R **19 Claims**



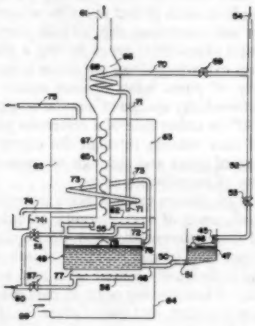
1. In a bird feeder including a vertically disposed hollow housing having a peripheral side wall, a removable top cover, a bottom wall, and at least one aperture in said side wall such that seed disposed in said housing at a height above said at least one aperture may normally pass freely as by gravity therethrough, the improvement comprising: a combination baffle, seed tray and perch device adapted for mounting on the outside of said side wall, said device including a vertically disposed peripheral collar of a configuration similar to said side wall and of a height at least essentially equal to the height of said at least one aperture and adapted to receive said housing therein with the inside of said collar and the outside of adjacent side wall portions in slidable face to face contact such that said collar may move across and accordingly cover said at least one aperture from a slight to an essentially complete obstruction thereof, mounting means for adjustably fixing the position of said collar vis-a-vis said housing whereby the flow of seed from said housing through the uncovered portion of said at least one aperture is determined, and said device further including a tray having an essentially flat inner rim portion outwardly extending from the periphery of said collar such that seed passing by gravity from said housing through said at least one aperture collects on said tray.

4,690,102

WATER HEATER AND DISTILLER APPARATUS

Glen Sundquist, Box 823, Watrous, Saskatchewan, Canada (S0K 4T0)

Division of Ser. No. 802,675, Nov. 29, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 5,551
Claims priority, application Canada, Dec. 6, 1984, 469526
Int. Cl.[4] F22B *5/00*; F24D *3/00*
U.S. Cl. 122—13 R **7 Claims**



1. A water heater and distiller apparatus adapted for utilizing

latent heat of water condensing in a distilling process for heating water, said water heater and distiller apparatus comprising:

a boiler chamber means for containing water to be boiled to steam, said boiler chamber means having an inlet for receiving water from a water supply and an outlet disposed for delivery of steam thereout said boiler chamber being closed except for said inlet and said outlet;

heating means for boiling water in said boiler chamber means;

a water heating tank means for containing water to be heated, said water heating tank means having an inlet for receiving water from a water supply and an outlet for passage of heated water thereout;

a condenser means disposed for being cooled by water in said water heating tank means, said condenser means having an inlet for receiving steam, an outlet for delivery of condensate thereout and means for collection of condensate from said outlet and arranged such that said condensate is removed for use separate from said boiler chamber means;

duct means communicating with said outlet of said boiler chamber means and said inlet of said condenser means for delivery of steam from said boiler chamber means to said condenser means;

a reservoir disposed laterally of said boiler chamber means, said reservoir being open to air pressure;

flow control means for controlling the flow of water from said reservoir for maintaining the level of water in said boiler chamber means below a predetermined maximum and above a predetermined minimum, said flow control means comprising a float valve controlled by a float, said float valve being adapted for closing upon said level of water moving to said predetermined maximum and adapted for opening upon moving of said water level to said predetermined minimum;

conduit means communicating between said boiler chamber means and said reservoir for communicating water from said reservoir to said boiler chamber means, at least a portion of the length of said conduit means being disposed entirely downwardly of said predetermined minimum so as to form a gas trap for impeding venting of steam from said boiler chamber means through said conduit; and

heating means separate from said condenser means for heating said water to be heated.

4,690,103

VISCOUS FAN COUPLING UNIT

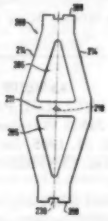
Werner Göb, Kürnach, and Peter Anders, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG

Filed Apr. 4, 1986, Ser. No. 848,812

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513785

Int. Cl.[4] F01P *5/02*

U.S. Cl. 123—41.12 **7 Claims**



1. A fan coupling unit for controlling the operation of a fan providing a cooling stream for an internal combustion engine system, said coupling unit comprising two rotor units rotatable about a common axis and defining at least one gap between them, said gap being fillable with a viscous liquid, said fan coupling unit further comprising a control member (**110, 210, 310**) controlling the torque transmitting condition of said viscous liquid within said gap in response to temperature, said control member (**110, 210, 310**) being engageable with a bimetallic element (**109, 209, 309**) having the shape of an elongate bimetallic strip with a long axis (**130, 230, 330**) and a short axis perpendicular to said long axis, said bimetallic strip (**109, 209, 309**) having end portions (**108, 208, 308**) spaced along said long axis (**130, 230, 330**) and supported by respective support members (**20**), and an intermediate portion acting onto said control member (**110, 210, 310**),

said bimetallic strip (**109, 209, 309**) having a separation slot (**105, 205, 305**) extending substantially along said long axis (**130, 230, 330**) and defining at least two partial strips (**114, 214, 314**) of said elongate strip (**109, 209, 309**), said partial strips (**114, 214, 314**) being interconnected with each other by said end portions (**108, 208, 308**) and by at least one cross-piece (**111, 211, 311**) located in the area of said intermediate portion.

4,690,104

CYLINDER HEAD WITH INWARDLY PROJECTING CUP PLUG IN CASTING SAND EXTRACTION HOLE FOR SPEEDING UP COOLANT FLOW

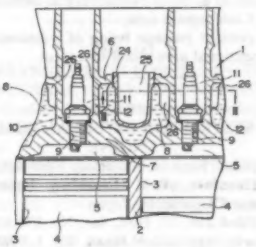
Masao Yasukawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 16, 1986, Ser. No. 864,086

Claims priority, application Japan, May 24, 1985, 60-111776

Int. Cl.[4] F01P *3/02*

U.S. Cl. 123—41.32 **7 Claims**



1. A cylinder head for an internal combustion engine having combustion chambers, the cylinder head comprising:

(a) an inner wall serving to define roofs of combustion chambers of the internal combustion engine;

(b) an outer wall spaced from the inner wall, the inner and outer walls defining a coolant plenum between said inner wall and said outer wall, with a coolant flow path being defined through said coolant plenum, and said outer wall having a casting sand extraction hole extending through said outer wall and opening to a region of said coolant plenum which has a cross-sectional area that is substantially larger than the cross-sectional area of said coolant flow path in a portion of the coolant plenum adjacent to said region; and

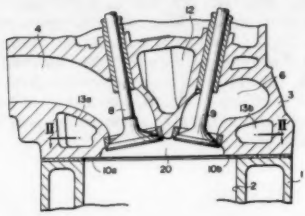
(c) a cup plug fitted into said casting sand extraction hole so as to block said hole, said cup plug projecting inwards into said coolant flow plenum so far as to reach nearly to said inner wall but to leave a coolant flow passage between the plug and the inner wall, thereby substantially reducing the cross-sectional area of said region of said coolant plenum.

4,690,105

CYLINDER HEAD WITH COOLANT PASSAGE FOLLOWING SQUISH AREA AND OF GENERALLY UNIFORM CROSS SECTIONAL AREA

Mutsumi Kanda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 16, 1986, Ser. No. 863,972
Claims priority, application Japan, May 30, 1985, 60-117561
Int. Cl.[4] F01P *3/02*
U.S. Cl. 123—41.82 R **6 Claims**



1. For an internal combustion engine of an automotive vehicle, comprising a cylinder block formed with a cylinder bore and a piston fitted in said bore and reciprocating therein:

a cylinder head for affixment to said cylinder block and for defining a combustion chamber in cooperation with said piston and said cylinder bore, formed with:

(a) a portion which extends from a portion lying over a peripheral portion of said cylinder bore toward a central portion of said combustion chamber and which in cooperation with a portion of said piston defines a squish area of said combustion chamber; and:

(b) a coolant passage formed through said cylinder head as convexly curved at a portion thereof adjacent to said squish area toward a central portion of said combustion chamber so as more extensively to overlie and directly to cool said squish area;

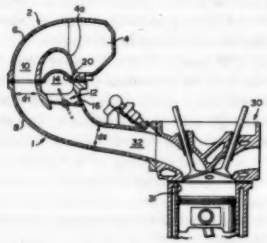
(c) said coolant passage being of substantially the same cross sectional area along its extent.

4,690,106

INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hideo Nakayama; Shuichi Nakatani; Fusatoshi Tanaka, and Hiroyuki Hanafusa, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Jun. 27, 1986, Ser. No. 879,639
Claims priority, application Japan, Jul. 1, 1985, 60-142578
Int. Cl.[4] F02B *75/18*
U.S. Cl. 123—52 M **11 Claims**



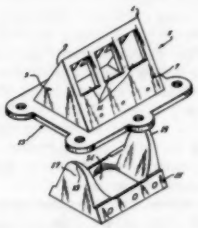
1. An intake system for an internal combustion engine having a plurality of cylinders comprising an intake manifold and a surge tank member connected together to form a plurality of first discrete intake passages each of which leads to one of the cylinders and is bowed substantially in a vertical plane and a volume chamber disposed on upstream ends of the first discrete intake passages characterized in that the intake manifold is provided with a plurality of second discrete intake passages each of which branches off from one of the first discrete intake passages to extend from an the inner side of the same and is shorter than the first discrete intake passages, and with a communicating passage for interconnecting the second discrete intake passages, a passage switching means being provided to open and close the second discrete intake passages according to an operating condition of the engine and a part of a wall defining the communicating passage being formed by a plate member sandwiched between the intake manifold and an outer wall of the surge tank member.

4,690,107

FLOW ENHANCER FOR REED INLET VALVES

Don R. Emler, 1430 West 259th St., Harbor City, Calif. 90710, and Glenn M. Thomas, 11621 Kathy La., Garden Grove, Calif. 92643

Filed Jun. 11, 1986, Ser. No. 873,590
Int. Cl.[4] F02B *75/02*
U.S. Cl. 123—65 V **8 Claims**



1. A flow enhancer insert for use in a roof prism shaped reed valve inlet frame of a two cycle internal combustion engine comprising:

an annular ring secured into an upstream portion of the reed valve inlet frame adjacent to a carburetor duct leading to the reed valve inlet frame, said ring being flush with an upstream opening face of the reed valve inlet frame and matching a downstream contour of the carburetor duct to an interior contour of the reed valve inlet frame; and two substantially triangular wedges each shaped so as to extend downstream from opposite sides of the annular ring and substantially to an interior apex of the reed valve inlet frame and each wedge to substantially cover an entire interior surface of each of two parallel triangular surfaces of the reed valve inlet frame with each wedge tapering outwards from the interior of the annular ring to cause substantially zero wedge thickness at an apex of each wedge and each wedge being attached at its base to the annular ring.

4,690,108

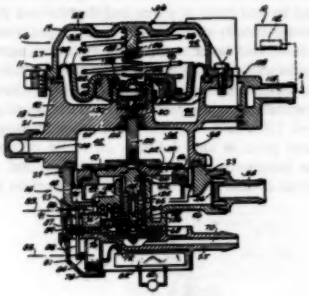
FUEL/OIL PUMP

Anthony F. Debevec, 38518 Waveland, Waukegan, Ill. 60087

Filed Jul. 31, 1985, Ser. No. 760,890
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—73 AD **35 Claims**

1. A pump comprising a housing, an oil pumping chamber in said housing, an oil outlet passageway in said housing communicating with said oil pumping chamber, an oil pumping piston reciprocally movable in said oil pumping chamber to produce oil flow into said oil outlet passageway in response to reciprocation of said oil pumping piston, a switch mounted on said housing and adapted to be operably connected to a device for actuation thereof, a second piston reciprocally movable in said housing relative to said oil outlet passageway between spaced

first and second positions, means biasing said second piston to said second position, and means for closing said switch in response to movement of said second piston to said first position, said means for closing said switch including a rocker arm having opposite first and second ends and being pivotally mounted in said housing for movement about a pivot point



intermediate said opposite ends, said first end being engageable with said second piston for movement in one direction in response to movement of said second piston to said first position, and said second end being engageable with said switch for closing said switch in response to movement of said first end in said one direction.

4,690,109

TWO-STROKE ENGINE

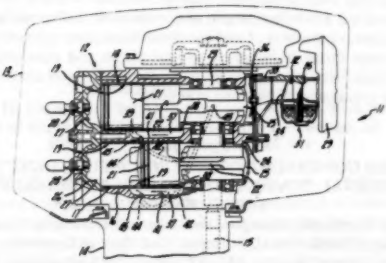
Takio Ogasahara, Shizuoka, and Hiroaki Fujimoto, Hamamatsu, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 18, 1985, Ser. No. 777,331

Claims priority, application Japan, Sep. 25, 1984, 59-199840

Int. Cl.⁴ F02B *33/04*

U.S. Cl. 123—73 A **8 Claims**



1. in a crankcase compression, two-cycle internal combustion engine having a cylinder and a crankcase, a piston reciprocating in said cylinder and a transfer passage extending between said crankcase and said cylinder for transferring a charge from said crankcase to said cylinder, said transfer passage having a horizontally extending portion defined by a lower horizontal wall upon which fuel condensation may collect, the improvement comprising separate conduit means for directing a high velocity flow along and intersecting said horizontal wall towards said cylinder for purging said horizontal wall of condensed fuel.

4,690,110

VARIABLE VALVE MECHANISM FOR INTERNAL COMBUSTION ENGINES

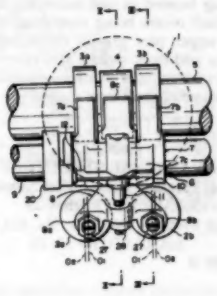
Hirofumi Nishimura, and Yasuyuki Morita, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 24, 1986, Ser. No. 855,436

Claims priority, application Japan, Apr. 26, 1985, 60-91564; Apr. 26, 1985, 60-91565; Apr. 26, 1985, 60-91567

Int. Cl.⁴ F01L *1/34*

U.S. Cl. 123—90.17 **12 Claims**



1. A valve mechanism for an internal combustion engine including cam means having two types of cams of different shapes which are rotated synchronously with engine rotation, rocker arm means adapted to be operated by selected one of said two types of cams for operating valve means, characterized by the fact that said cam means includes a central cam of a first type and a pair of side cams of a second type which are disposed at the opposite sides of and symmetrically with respect to the central cam.

4,690,111

BEARING ARRANGEMENTS FOR BALANCING SHAFTS OF INTERNAL COMBUSTION ENGINES

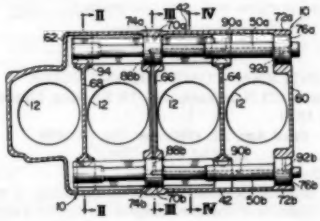
Kouji Kohno; Hiroichi Takubo, and Toshinobu Ito, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 28, 1985, Ser. No. 792,253

Claims priority, application Japan, Oct. 29, 1984, 59-163306[U]; Oct. 29, 1984, 59-163307[U]; Oct. 30, 1984, 59-164096[U]

Int. Cl.⁴ F16F *15/10, 15/26*

U.S. Cl. 123—192 B **11 Claims**



1. An internal combustion engine including cylinder block means having inner wall means defining at least one cylinder bore, outer wall means provided outside the inner wall means and defining cooling water jacket means with said inner wall means, deck means provided below and continuous with said outer wall means to provide at least partly an upper part of crankcase means, a piston disposed in said cylinder bore for

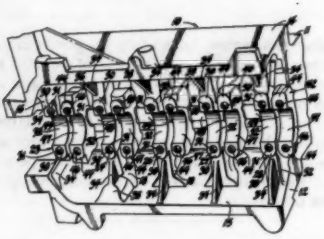
reciprocating movements, crankshaft means disposed in said crankcase means and connected with said piston means so that a reciprocating movement of the piston is converted into a rotation of the crankshaft means, balancing shaft means supported by said cylinder block means in parallel with said crankshaft means and having eccentric mass means, said balancing shaft means being rotated to counterbalance effects of reciprocating mass in said cylinder block means, said cooling water jacket means having a lower end located above the deck means, said inner wall means having downward extension means extending downwardly beyond said deck means, said downward extension means and said upper part of said crankcase means defining balancing shaft case means, said balancing shaft means being located in said balancing shaft case means, said balancing shaft means being supported by bearing means formed in said upper part of said crankcase means at least partly defined by said deck means, said eccentric mass means being located in said cylinder block means and housed at least partly in said balancing shaft case means.

4,690,112

CRANKCASE STRUCTURE

Philip D. Arnold, Pleasant Ridge, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 20, 1986, Ser. No. 831,423
Int. Cl.[4] B21D *53/10*
U.S. Cl. 123—195 R **7 Claims**



1. An integral crankcase comprising
a pair of laterally spaced longitudinally extending side walls partially defining a crank chamber,
a plurality of transverse webs extending between the side walls at longitudinally spaced locations therealong, each of said webs having a journal receiving portion with a bearing recess located between the walls, said recesses being substantially longitudinally coaxial, and
separable bearing caps formed adjacent longitudinally to said journal receiving portions, said caps each having a bearing recess coaxial with the recesses of said journal receiving portions and with one another.

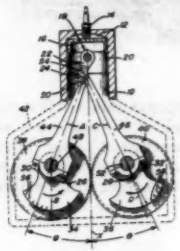
4,690,113

INTERNAL COMBUSTION ENGINE

Olivier Deland, 821 Normandie, No. 18, St. Jean, Quebec, Canada (J3A 1K6)

Filed Apr. 30, 1986, Ser. No. 857,499
Int. Cl.[4] F02B *75/32*
U.S. Cl. 123—197 AC **12 Claims**

1. In an internal combustion engine including a cylinder defining a combustion chamber adapted to receive a combustible mixture for the combustion thereof, a piston slidably mounted in said cylinder for reciprocating movement between a first limit position whereat the combustion chamber defines its minimum volume and a second limit position whereat the combustion chamber defines its maximum volume, a pair of rotatably mounted parallel crankshafts arranged equidistantly relative to the longitudinal axis of said cylinder and each having a crank-arm rotatable about its respective crankshaft axis, and means coupling said crankshafts together for synchronising the rotation thereof with the crank-arm of one of said crankshafts having an angular advance over the crank-arm of the other crankshaft, the improvement comprising a single-arm lever pivotally connected at one end thereof to said piston for pivotal movement about a pivot axis extending normal to the longitudinal axis of said cylinder, and a pair of connecting rods interconnecting said lever and the respective crank-arms of said crankshafts with one of said connecting rods being pivotally connected to said lever at a free end thereof and the other connecting rod pivotally connected to said lever intermediate the ends thereof, said lever comprising two arm portions of different lengths with one of said arm portions extending radially from the pivot axis about which said lever pivots and the other arm portion extending from said one arm portion at an angle of about 150°, said one arm portion being longer than said other arm portion and defining an angle of about 13° relative to an imaginary line intersecting the pivotal connections at the ends of said lever, said other arm portion and said



imaginary line defining therebetween an angle of about 17°, said lever together with said connecting rods defining a position control means for enabling said lever to pivot and move past said longitudinal axis when said piston reaches said first limit position and to thereby maintain said piston substantially stationary at said first limit position for a period of time sufficient to permit the crank-arm of said one crankshaft to move past dead-center, whereby substantially maximum compression is achieved in said combustion chamber during a compression stroke of said piston when said piston is at said first limit position while the crank-arm of said one crankshaft is positioned past dead-center and the pivotal connections of said connecting rods to said lever are positioned on a side of said longitudinal axis whereat said one crankshaft is disposed such that upon combustion of said combustible mixture substantially maximum thrust is imparted to said piston and substantially maximum force is transmitted to the connecting rod connected to the crank-arm of said one crankshaft.

4,690,114

SPEED GOVERNING SYSTEM FOR A FUEL INJECTED INTERNAL COMBUSTION ENGINE, ESPECIALLY A DIESEL ENGINE

Guido Weischedel, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 741,182, Jun. 4, 1985, abandoned. This application Dec. 8, 1986, Ser. No. 940,225
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429672
Int. Cl.[4] F02M *31/00*
U.S. Cl. 123—357 **13 Claims**

1. A method of controlling the operation of a fuel injected internal combustion engine (ICE), especially a diesel engine, upon commanding decrease of engine speed in a direction towards a predetermined idling speed (NL),
utilizing an idle speed controller (R) which has proportional-integrating characteristics,
said method comprising

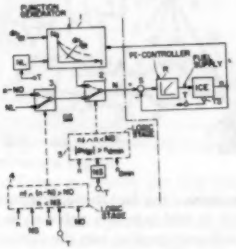
establishing a predetermined speed threshold (NS) which is above the predetermined idling speed (NL);

supplying an input signal to the controller (R) representative of the actual instantaneous speed of the engine (n);

supplying an input signal to the controller (R) representative of a commanded instantaneous engine speed (N) of the engine;

determining when the actual speed (n) of the engine drops below said predetermined speed threshold (NS), and generating a control signal;

and controlling the commanded rate of change of speed of the engine upon sensing that the actual speed (n) of the engine has dropped below said predetermined speed threshold (NS) towards said predetermined and lesser idling speed (NL) of the engine in accordance with an exponential function (e),



wherein the exponential function determining the rate of change of speed is defined as follows:

$$N=NL+(NS-NL)e^{(-t/K)}$$

wherein

$$K=dn/dt\cdot KV+KO$$

and wherein dn/dt is time rate of change of actual engine speed and wherein

KV is a constant

KO is a constant

t represents time

NL represents the predetermined idle speed;

NS the predetermined speed threshold; and

dn/dt the actual rate of drop in engine speed.

4,690,115

ENGINE GOVERNOR

James H. Conlogue, Westmont, and Henry Banker, Villa Park, both of Ill., assignors to Hoof Products Co., Chicago, Ill.

Filed Aug. 2, 1985, Ser. No. 761,969

Int. Cl.[4] F02D *1/04*

U.S. Cl. 123—366 **8 Claims**

1. In an engine governor of the type comprising a housing; an input shaft, rotatably mounted to the housing; an output shaft, rotatably mounted to and extending into the housing; and means, included within the housing, for applying a torque to the output shaft in a fuel decreasing direction as a selected function of the rotational speed of the input shaft, the improvement comprising:

an output plate mounted to the output shaft outside of the housing to rotate with the output shaft;

a stop plate mounted to rotate freely about the output shaft;

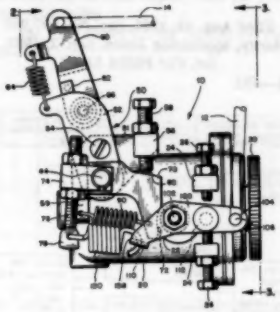
a stop secured to the housing and positioned to abut the stop plate to limit movement of the stop plate in a fuel increasing direction, opposed to the fuel decreasing direction;

an additional stop secured to the output plate to cause the stop plate to rotate with the output plate in the fuel decreasing position and to allow the output plate to rotate independently of the stop plate in the fuel increasing direction;

a first spring coupled to the stop plate;

means for securing the first spring to the housing such that the first spring biases the stop plate against the stop in the fuel increasing direction;

a second spring coupled between the stop plate and the output plate to bias the output plate in the fuel increasing direction with respect to the stop plate;



said second spring operative to move the output plate into an over fuel range of positions when the rotational speed of the input shaft is less than a selected value and the torque applying means applies a lesser torque to the shaft than that applied by the second spring; and

said stop operative to limit movement of the output plate to a range of positions characterized by a maximum continuous fuel position when the rotational speed of the input shaft is greater than the selected value and the torque applying means applies a greater torque to the shaft than that applied by the second spring.

4,690,116

SYSTEM FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE AND METHOD THEREFOR

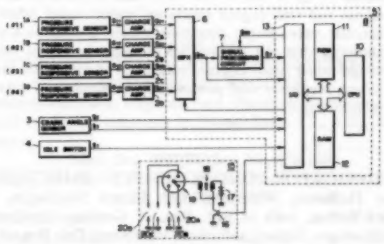
Nobutaka Takahashi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Claims priority application Japan, Oct. 17, 1985, 60-229930

Filed Sep. 17, 1986, Ser. No. 908,309

Int. Cl.[4] F02P *5/15, 11/00*

U.S. Cl. 123—425 **21 Claims**



1. A system for controlling a multi-cylinder internal combustion engine, comprising:

(a) first means associated with each cylinder of the engine for monitoring internal pressure variations therein;

(b) second means for determining whether said first means for any of the cylinders is malfunctioning on the basis of the pressures measured by said first means; and

(c) third means for controlling the ignition timing for each cylinder on the basis of the pressures measured by said first means and retarding the ignition timing for any one of

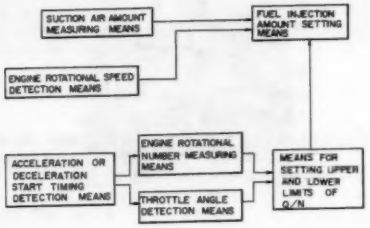
cylinders or any cylinders in which the associated first means is determined by said second means to be malfunctioning.

4,690,117

FUEL INJECTION CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Toshiaki Isobe, Nagoya, and Hidehiro Oba, Aichi, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 19, 1986, Ser. No. 897,940
Claims priority, application Japan, Sep. 3, 1985, 60-194377
Int. Cl.[4] F02M *51/00*
U.S. Cl. 123—492 **6 Claims**


SUCTION AIR AMOUNT MEASURING MEANS
FUEL INJECTION AMOUNT SETTING MEANS
ENGINE ROTATIONAL SPEED DETECTION MEANS
ACCELERATION OR DECELERATION START TIMING DETECTION MEANS
ENGINE ROTATIONAL NUMBER MEASURING MEANS
THROTTLE ANGLE DETECTION MEANS
MEANS FOR SETTING UPPER AND LOWER LIMITS OF Q/N

1. A fuel injection control device for internal combustion engine including suction air amount measuring means for measuring suction air amount Q, engine rotational speed detection means for detecting a number of rotations N of the engine per fixed time, and fuel injection amount setting means for setting a fundamental fuel injection amount according to a suction air amount signal generated by said suction air amount measuring means and an engine rotational speed signal generated by said engine rotational speed detection means; said fuel injection control device comprising:

transitional operation start timing detection means for detecting an acceleration start timing or a deceleration start timing of the engine;

engine rotational number measuring means for measuring a predetermined number of rotations of the engine from the acceleration start timing or the deceleration start timing;

throttle valve angle detection means for detecting that a throttle valve angle is out of a set range; and

means for setting an upper limit value and/or a lower limit value of Q/N calculated from said suction air amount signal and said engine rotational speed signal when said throttle valve angle detection means generates a signal showing that the throttle valve angle is out of said set range until said engine rotational number measuring means measures said predetermined number of rotations of the engine.

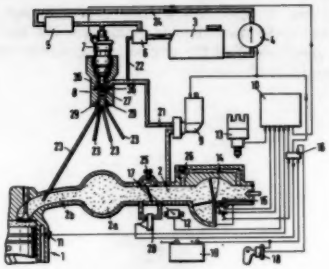
4,690,118

DEVICE FOR CONTINUOUS FUEL INJECTION

Peter Hofbauer, Wolfsburg, and Jürgen Sandhagen, Vordorf/Rethen, both of Fed. Rep. of Germany, assignors to Volkswagen Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

PCT No. PCT/EP85/00334, § 371 Date Mar. 12, 1986, § 102(e) Date Mar. 12, 1986, PCT Pub. No. WO86/00669, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 8, 1985, Ser. No. 847,905
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425856
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—533 **6 Claims**

1. Device for continuous injection of fuel into the intake lines of a multi-cylinder mixture-compressing internal combustion engine, with an air pump delivering a carrier air current branched off the intake line and with a fuel pump which delivers the fuel from a fuel tank to a metering device which apportions the fuel to the carrier air current as a function of the operating state of the internal combustion engine, the device comprising means for division of the carrier air current among carrier air injection lines separately associated with the individual cylinders of the internal combustion engine, the metering device being provided as an injection valve having a head part and a valve body which is adjustable relative to said head



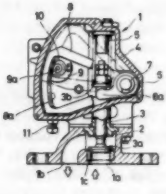
part so as to deliver the fuel through separate injection openings provided in said injection valve so as to be individually associated with and opening into the carrier air injection lines said head part of the injection valve being provided with an annular carrier air reservoir which surrounds the injection valve concentrically and is connected to the air pump, said carrier air injection lines being provided so as to individually branch off the carrier air reservoir at uniform intervals over the circumference of said reservoir.

4,690,119

EGR VALVE DEVICE OF INTERNAL COMBUSTION ENGINES OF AUTOMOBILES

Hiroshi Makino, and Akio Sasaki, both of Odawara, Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Japan

Filed Aug. 6, 1986, Ser. No. 893,776
Claims priority, application Japan, Aug. 6, 1985, 60-119953
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—571 **3 Claims**



1. An EGR valve device for internal combustion engines of automobiles, comprising:

a valve body;

a valve rod slidably borne on said valve body and having, at one end, a valve member capable of opening and closing an exhaust gas recirculation path and being urged to close the valve;

a sector-shaped member rotatably supported on said valve body and operatively coupled to said valve rod and having a gear portion; and

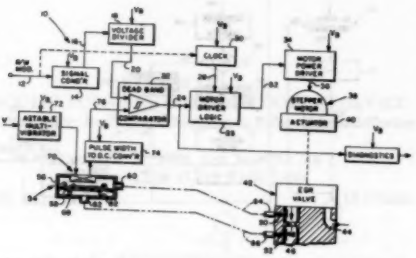
a driving motor secured to said valve body in such a way that its rotary member shaft intersects a plane containing said sector-shaped member at right angles, and having a pinion secured to said rotary member shaft and meshed with said gear portion of said sector-shaped member.

4,690,120

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

Lawrence E. Egle, Itasca, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 25, 1986, Ser. No. 832,902
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—571 29 Claims



1. A system for controlling exhaust gas recirculation (EGR) in an internal combustion engine:

(a) base means defining an exhaust gas inlet port, an exhaust gas outlet port and an EGR passage communicating said inlet port with said outlet port, said base means adapted for attachment to an exhaust passage and a combustion chamber inlet passage of an engine;

(b) flow valve means disposed in said passage and including a valve seat and poppet member operable upon movement with respect to said seat for controlling EGR flow between said inlet and said outlet;

(c) actuator means operable upon receipt of an electrical control signal to move said poppet, said actuator means including:

(i) a stepper motor,

(ii) an axial lead means operatively rotated by said stepper motor,

(iii) follower means guided for axial movement, and operably connected to move said poppet in response to rotation of said lead means;

(d) plate means disposed in said EGR passage between said seat and said outlet port and defining a flow measuring orifice;

(e) pressure tap means operative to sense the pressure in said passage on the upstream and downstream sides of said orifice;

(f) transducer means operative in response to the pressure in said pressure tap means to provide said electrical control signal for said stepper motor, said transducer means including,

(i) pressure responsive means operative to move in response to changes in the pressure differential across said orifice sensed by said pressure tap means,

(ii) a non-magnetic member disposed for movement with said pressure responsive means,

(iii) inductive means disposed spaced closely adjacent said pressure responsive means, said inductive means operative upon electrical energization to generate eddy currents in said non-magnetic member, said eddy currents operative to alter the inductance of said inductive means in accordance with movement of said non-magnetic member,

(iv) circuit means operative to detect said change in inductance and emit a change signal representative thereof, and,

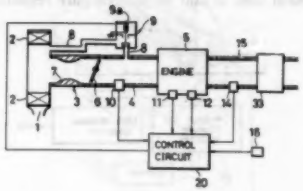
(v) driver circuit means responsive to said change signal and operative to provide a control signal for indexing said stepper motor by an amount corresponding to the change in position of said pressure responsive means.

4,690,121

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH A DUTY RATIO CONTROL OPERATION

Tomohiko Kawanabe; Masahiko Asakura; Takanori Shiina, all of Wako; Yukihiro Matsumoto, Fujimi, and Minoru Muroya, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1986, Ser. No. 818,630
Claims priority, application Japan, Feb. 16, 1985, 60-028758; Sep. 30, 1985, 60-218505
Int. Cl.[4] F02M *23/06, 23/08, 23/10*
U.S. Cl. 123—589 6 Claims



2. An air intake side secondary air supply system for an internal combustion engine having an air intake passage with a carburetor and an exhaust passage, comprising:

an air intake side secondary air supply passage communicating with the air intake passage on the downstream side of said carburetor;

an open/close valve disposed in said air intake side secondary air supply passage;

an oxygen concentration sensor disposed in the exhaust passage; and

detection and control means for detecting whether an air-fuel ratio of mixture to be supplied to the engine is leaner or richer with respect to a target air-fuel ratio through a level of an output signal of the oxygen concentration sensor and for periodically actuating said open/close valve, said detection and control means decreasing a valve open period of said open/close valve within each cyclic period by a first predetermined amount when a detected air-fuel ratio of mixture is leaner than the target air-fuel ratio and increasing the valve open period by a second predetermined amount when the detected air-fuel ratio of mixture is richer than the target air-fuel ratio, said second predetermined amount being different from said first predetermined amount.

4,690,122

IGNITION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hachirou Sasakura, Inuyama, and Masakuni Tsujimura, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 3, 1986, Ser. No. 870,144
Claims priority, application Japan, Jun. 4, 1985, 60-121253
Int. Cl.[4] F02P *5/00*
U.S. Cl. 123—609 4 Claims

1. An ignition control system for internal combustion engines comprising:

a reference angle sensor for detecting the rotational speed of the internal combustion engine and generating a reference angle signal by discriminating a point near the top dead center;

an angle sensor for detecting the rotational speed of the internal combustion engine and generating an angle signal by discriminating the revolutions for each predetermined angle; and

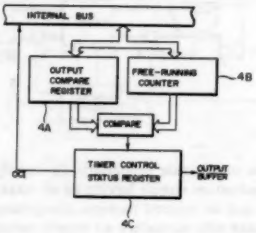
a microcomputer including an output compare register, a free-running counter and a timer control status register for computing the ignition timing and the ignition coil energi-

zation time thereby to control the energization of the ignition coil in response to said reference angle signal, said angle signal and data on the operating conditions representing at least the amount of intake air,

said microcomputer further including:

output compare interrupt means for starting or cutting off the energization of the ignition coil in accordance with the value set in the timer control status register at the time point when the value on the output compare register coincides with that on the free-running counter, while at the same time meeting the request for the output compare interrupt in the microcomputer;

first setting means for setting the sum of a value corresponding to a predetermined maximum energization time and the present time in said output compare register and set-



ting a value for cutting off the energization in said timer control status register, when the energization of said ignition coil is started;

second setting means for setting again in said output compare register the sum of a value corresponding to the time representing the angle remaining before said ignition timing and the present time at the time when the angle signal immediately before the ignition timing computed on the basis of said operating conditions is input; and

third setting means for setting in said output compare register the sum of a value corresponding to the cut-off time computed on the basis of said operating conditions and the present time and setting a value for energization start in said timing control status register at the time point when the energization of the ignition coil is cut off.

4,690,123

CONTROL OF IGNITION TIMING UPON OCCURRENCE OF ABNORMALITY IN A REFERENCE CRANK ANGLE POSITION SENSING SYSTEM

Shigehiro Kimura, Niiza; Takashi Ono, Wakoh, and Nobuyuki Narisawa, Toshima, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,523

Claims priority, application Japan, May 27, 1985, 60-113757

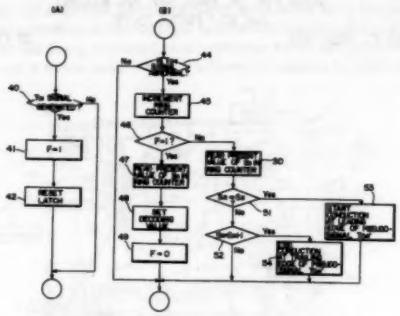
Int. Cl.[4] F02P *9/00*

U.S. Cl. 123—612 **2 Claims**

1. A method of controlling ignition timing of an internal combustion engine when an abnormality develops in a system for sensing a reference crank angle position of a crankshaft of the engine, in which the timing at which an ignition coil starts and stops conducting is controlled on the basis of a first pulse signal generated once per at least two revolutions of the crankshaft at a predetermined crank angle position associated with a particular cylinder of the engine, a second pulse signal indicative of a predetermined reference crank angle position of the crankshaft for each cylinder, and a third pulse signal indicative of predetermined angular positions of the crankshaft, the method comprising the steps of:

sensing an abnormality in the reference crank angle position sensing system for sensing said predetermined reference crank angle position;

generating a pseudo-signal pulse having a predetermined pulse width in place of said second pulse signal on the basis of said first and third pulse signals when said second pulse signal fails to be generated because of the abnormality in said reference crank angle position sensing system;



starting conduction of said ignition coil at a leading edge of said pseudo-signal pulse; and

stopping conduction of said ignition coil at a trailing edge of said pseudo-signal pulse.

4,690,124

SPARK CONTROL SYSTEM FOR AN ENGINE

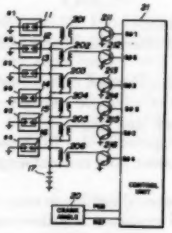
Kazuhiro Higashiyama, Ebina, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed May 8, 1986, Ser. No. 861,006

Claims priority, application Japan, Jun. 5, 1985, 60-120397

Int. Cl.[4] F02P *23/00*

U.S. Cl. 123—643 **3 Claims**



1. A spark control system for an engine having a crankshaft and cylinders, each of the cylinders being associated with an ignition coil and a power transistor for controlling the ignition coil, the system comprising:

(a) means (21) for generating reference signals at reference crank angles corresponding to the cylinders respectively, wherein the cylinders are separated into groups and the cylinders in a common group are different from each other by an interval or 360° in crank angle, wherein the reference signals corresponding to the cylinders in a common group are similar to each other and the reference signal corresponding to the cylinder in a group is different from the reference signal corresponding to the cylinder in other group, and wherein the reference signal corresponding to preset one of the cylinders is different from the reference signals corresponding to the other cylinders;

(b) means for, during engine start, causing sparks simultaneously in the cylinders in a common group in accordance with the reference signals corresponding to said cylinders in said gorup until the reference signal corresponding to the preset cylinder is generated; and

(c) means for, when and after the reference signal corre-

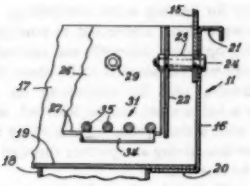
sponding to the preset cylinder is generated, causing a spark in one of the cylinders sequentially in a predetermined orer starting from the preset cylinder.

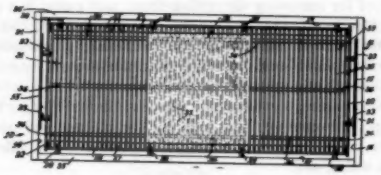
4,690,125

MESQUITE BURNING OUTDOOR COOKING DEVICE

Frank W. Beller, Aurora, Ill., assignor to Belson Manufacturing Co., Inc.

Filed Oct. 21, 1985, Ser. No. 789,741
Int. Cl.[4] A47J *37/00*; F24B *3/00*
U.S. Cl. 126—25 A **13 Claims**





1. A high temperature outdoor cooking device suitable for use with hot burning materials such as mesquite charcoal, or equivalent, said cooking device comprising:

a firebox having interconnected side walls and a bottom wall;

a grill assembly means supportably arranged over the firebox for retaining items to be cooked;

liner sheet means forming a curtain-like barrier inwardly of the side walls and comprising at least four separate unconnected liner sections each liner section associated with means for disengagenbly attaching it to and spacing it inwardly of a firebox side wall and wherein each said liner section is individually removable from the cooking device facilitating selective replacement of any one thereof without disengaging any of the others, said liner sheet means including opposing liner sections thereof having opposing shelf support means;

grate means being supportable by said shelf support means within the firebox at a distance above the bottom wall of said firebox, said liner sheet means being arranged to laterally surround said grate means whereby to insulate said firebox side walls from material burning on said grate means, and wherein said grate means is freely removably from said support shelf means;

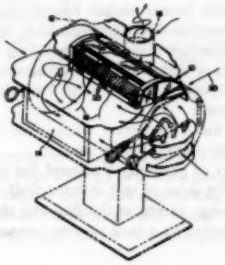
said cooking device being capable of combusting mesquite charcoal, or equivalent, as a heat source for extended use therewith whereby the liner sheet means protects the firebox side walls from heat degradation which might otherwise be caused by temperatures ranging up to about 1500° F.

4,690,126

CATALYTIC COMBUSTION ASSEMBLY FOR WOOD-BURNING STOVE

David R. Jencks, Rogue River, and Mark R. Nelson, Medford, both of Oreg., assignors to Orley's Manufacturing Co., Inc., White City, Oreg.

Filed Jul. 14, 1986, Ser. No. 885,425
Int. Cl.[4] F24C *1/14*
U.S. Cl. 126—77 **5 Claims**



1. A catalytic combustor for a wood-burning stove, the stove including a flue outlet and a firebox having a ceiling and a primary air inlet for supplying primary air to the firebox, comprising:

an insertable housing having a pair of spaced-apart parallel walls having tops, the walls defining an airtight passageway for volatile gases from the firebox to the outlet, the tops of the walls shaped to engage and hermetically seal against the ceiling of the firebox surrounding the flue outlet, the housing further defining a pair of secondary air inlets and a connected U-shaped conduit having lateral portions running parallel to the housing walls and a transverse portion running between the housing walls across the entrance of the passageway to release secondary air into the passageway;

a catalytic combustor mounted within the housing across the passageway to intercept the volatile cases and burn them with the secondary air;

a bypass door pivotally mounted to a base of the housing for opening and closing a bypass opening in the base, the bypass opening allowing the volatile gases within the firebox to bypass the combustor in passing from the firebox to the flue outlet;

a mixing screen sealingly mounted within the housing across the defined passageway upstream of the catalytic combustor, the screen having a plurality of holes to promote mixing of the secondary air released from the transverse conduit and the volatile gases from the firebox; and

an inclined baffle mounted within the housing across the passageway downstream of the catalytic combustor for impeding the gas flow therethrough to increase the residency time of the gases within the catalytic combustor and thereby promote a cleaner burn, the baffle positioned below the flue outlet and including an upturned tip portion for guiding the gas flow into the outlet.

4,690,127

CATALYTIC COMBUSTION DEEP FAT FRYER

Gerald W. Sank, Pasadena, Md., assignor to Vulcan-Hart Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 734,844, May 16, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,019
Int. Cl.[4] A47J *27/00*
U.S. Cl. 126—391 **17 Claims**

1. A deep fat fryer, comprising

(a) an open-top vessel adapted to hold a quantity of cooking oil;

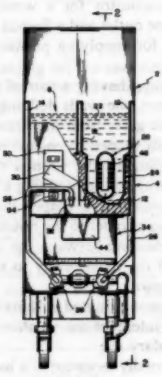
(b) heater means for heating the oil in said vessel, said heater means including

(1) hollow, elongated heat exchange means arranged within said vessel and adapted for immersion in the oil, said heat exchange means having a generally oval interior vertical cross-sectional configuration, a combustion end portion and a flue end portion;

(2) fiber matrix burner means mounted within said heat exchange means and closing the combustion end thereof, said burner means having a generally oval vertical cross sectional configuration, the longitudinal axis of said burner means corresponding with the longitudinal axis of said heat exchange means, whereby said burner is symmetrically arranged within said heat exchange means;

(3) ignition means mounted within said heat exchange means adjacent said burner means;

(4) a plurality of generally U-shaped fins connected with the opposite sides of said interior wall surface of said heat exchange means at the flue end thereof, each of said fins including a base portion connected with said



interior side wall surface and a pair of leg portions extending inwardly toward and spaced from the leg portions of a corresponding fin connected with the opposite side of said interior wall surface, whereby said fins are arranged in opposed pairs; and

(5) core buster means arranged between said opposed pairs of fins, said core buster means including

(i) a rear portion extending longitudinally of said heat exchange means in contiguous relation with the end edges of said fin leg portions, thereby to define a channel within each of said U-shaped fins; and

(ii) a front portion integral with said rear portion and extending toward said burner means for deflecting heat and exhaust from said burner means into said channels, whereby a greater quantity of heat is transferred to the outer wall surface of said heat exchange means owing to the U-shaped fins and to the reduction of cross-sectional area of said heat exchange means due to said core buster means; and

(c) means for supplying a combustion mixture of gas and air to the interior of said fiber matrix burner means, whereby upon operation of said burner means, heat from said heat exchange means is used to heat the oil to a given temperature.

4,690,128

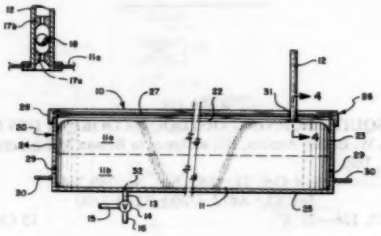
INSULATED FLEXIBLE BLADDER SOLAR COLLECTOR

Carl B. Gibbons, 720 S. 1650 East, Clearfield, Utah 84015

Filed Sep. 8, 1986, Ser. No. 904,200

Int. Cl.[4] F24J *2/56*

U.S. Cl. 126—450 **12 Claims**



1. A solar collector for heating water comprising:

(a) a housing having a floor, connected to contiguous upwardly extending opposing sidewalls and endwalls and a removable transparent lid adapted to fit about said sidewalls and endwalls, said lid containing an aperture through which a valve stem can be inserted, said floor being covered with a dark radiation absorbing material, said floor further containing an aperture through which a water line can be inserted,

(b) a non-opaque soft flexible plastic bladder contained in said housing said bladder having an inlet line for filling the bladder with water and an outlet line in the lower portion thereof for removing water therefrom, said outlet line in said bladder extending through said aperture in the floor of said housing, said bladder also containing an upwardly extending valve stem in the upper portion thereof extending through said aperture in said transparent lid, said valve stem containing a valve which allows air in said bladder to escape, prevents air from entering the bladder and prevents water from overflowing the bladder when filled with water; and

(c) wherein at least one of said transparent lid or the upper portion of said bladder contains ultraviolet light absorbing properties to inhibit the transmission of ultraviolet solar rays therethrough.

4,690,129

TERMINAL UNIT FOR A BALANCED FLUE

Christopher Halstead, Accrington, England, assignor to Myson Heating Limited, London, England

Continuation of Ser. No. 760,770, Jul. 31, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,918

Claims priority, application United Kingdom, Aug. 2, 1984, 8419767; Mar. 11, 1985, 8506260

Int. Cl.[4] F24C *3/00*

U.S. Cl. 126—85 B **12 Claims**

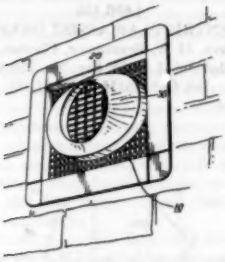
1. A terminal unit for a balanced flue, the unit comprising:

an air inlet duct having an inlet mouth;

an outlet duct having an outlet mouth, said outlet duct projecting beyond said inlet mouth by a distance of from 20 mm to 50 mm so that in use, combustion products are expelled from said outlet duct, in a substantially uninhibited manner, even when air currents pass across, or towards said unit; and

a plate which has a flared configuration surrounding said outlet duct and extending from said outlet mouth and towards said inlet mouth such that the perimeter of the

flared plate meets the planar portion of the inlet mouth to cover part of the inlet mouth, whereby combustion products expelled from said outlet duct are substantially prevented from entering said inlet duct.

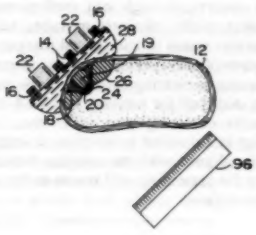


4,690,130

ELECTROMAGNETIC THERAPY CONTROL SYSTEM

Stuart G. Mirell, 10816 Cushdon Ave., Los Angeles, Calif. 90064

Filed Dec. 19, 1985, Ser. No. 811,159
Int. Cl.[4] A61B *17/52*
U.S. Cl. 128—1.3 **13 Claims**



1. A method for applying a therapeutic agent to a treatment zone in a patient, which treatment zone is not adjacent the skin of the patient, comprising:

applying a steady or low frequency magnetic field to the patient to include the treatment zone;

supplying microspheres for circulation through the patient to include said zone, said microspheres including a therapeutic agent, and also includes medically bodily compatible magnetic material having a Curie point at which the magnetic material becomes substantially non-magnetic slightly above the normal body temperature of the patient; and

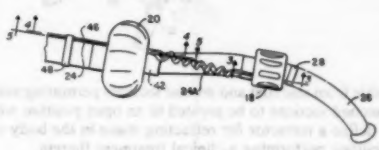
applying high frequency electromagnetic field energy to said patient where said magnetic field is applied to said patient, except to said treatment zone, to heat up said magnetic material to demagnetize it so the microspheres are not restrained by said magnetic field except in said treatment zone.

4,690,131

MEDICAL APPARATUS

James E. Lyddy, Jr., Arlington, Mass.; William Z. Penland, and Paul H. Sugarbaker, both of Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 740,171, May 31, 1985, abandoned. This application May 12, 1986, Ser. No. 862,111
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 **29 Claims**



1. A device capable of being used with an elongated flexible instrument of the type adapted to at least partially extend into the lumen of a tubular body part and having a front end for leading said instrument through said lumen and a rear end opposite said front end, said device comprising, in combination:

a front cuff adapted to be secured to said instrument in the proximity of said front end of said instrument and radially expandable so that said front cuff is capable of moving with said instrument through said lumen when said cuff is deflated, and contacting the interior walls of said body part when said front cuff is inflated;

an elongated flexible sheath capable of being coaxially mounted on and axially slidable with respect to said instrument between said front cuff and said rear end of said instrument so that said sheath is adapted to at least partially extend into said lumen with said instrument, said sheath comprising a forward end near and axially movable with respect to said front cuff and a back end near and axially movable with respect to said rear end of said instrument;

a rear cuff secured to said sheath in the proximity of said forward end of said sheath, said rear cuff being relatively movable with respect to said front cuff when said front cuff is secured to said instrument and said sheath is coaxially mounted on said instrument and radially expandable so that said rear cuff is capable of moving with said sheath through said lumen when said rear cuff is deflated, and contacting the interior walls of said body part when said rear cuff is inflated; and

means for selectively inflating and deflating each of said front and rear cuffs;

wherein said sheath and rear cuff when mounted on said instrument are movable relative to said instrument and said rear cuff is inflatable so that at least a portion of said body part and the corresponding lumen can be straightened with said sheath and rear cuff and so that said instrument can advance through said corresponding lumen.

4,690,132

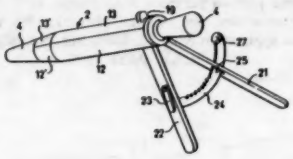
ENDOSCOPE PARTICULARLY USEFUL AS AN ANOSCOPE

Izhak Bayer, 58 Ahad Ha'am Street, Herzlia, and Amnon Adoram, 14 Kaplanski Street, Givatayim, both of Israel

Filed Apr. 7, 1986, Ser. No. 849,212
Claims priority, application Israel, Apr. 9, 1985, 74847
Int. Cl.[4] A61B *1/00, 17/02*
U.S. Cl. 128—4 **18 Claims**

1. An endoscope device particularly useful an an anoscope, characterized in that it includes a plurality of sections each of the configuration of a segment of a cylinder, said plurality of sections comprising a first section, a second section pivotable to said first section along one edge thereof, and a third section

attachable to said first and second sections along their opposite edges to define therewith a tubular endoscope insertable into a body cavity for examining same, said thrid section being de-



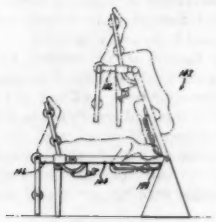
tachable from said first and second sections permitting said first and second sections to be pivoted to an open position wherein they define a retractor for retracting tissue in the body cavity to facilitate performing a clinical treatment therein.

4,690,133

INVERSION APPARATUS

Achilles N. George, 7688 S. Strawtown Pike, Jonesboro, Ind. 46938

Filed Sep. 12, 1985, Ser. No. 775,143
Int. Cl.[4] A61H *1/02*; A63B *21/00*
U.S. Cl. 128—25 R **16 Claims**



1. Inversion apparatus for enabling an individual to be supported from the legs in an inverted position, said apparatus comprising:

a supporting base;

a frame assembly including a platform having one end pivotably supported on said supporting base for movement between a generally horizontal position and a generally vertical position, said platform having an articulated portion pivotably connected to the other end thereof, said articulated portion being adapted to supportingly engage the front upper portion of said individual's legs when said individual is in a face down position on said platform;

a gear segment secured to said articulated portion;

drive means engageable with said gear segment for selectively pivoting said articulated portion and maintaining said articulated portion in a desired angular relationship to said platform;

a knee support means secured to said articulated portion of said platform and adapted to supportingly engage said individual's legs at the back of the knees;

elongated instep support means pivotably supportingly secured to said frame assembly in generally parallel spaced relationship to said knee support means and adapted to supportingly engage said individual's instep;

adjustment means for securing said instep support means in any one of a variety of circumferential positions with respect to said knee support means whereby said individual may be supported in an inverted position with the upper and lower leg portions positioned at any desired angulation therebetween; and

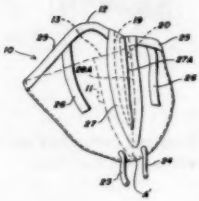
drive means for effecting movement of said platform, said drive means including means to maintain said platform at any desired degree of angulation between said generally horizontal position and said generally vertical position.

4,690,134

VENTRICULAR ASSIST DEVICE

Robert V. Snyders, 31 W. Brentmoor, Clayton, Mo. 63105

Filed Jul. 1, 1985, Ser. No. 750,477
Int. Cl.[4] A61H *9/00, 31/00*
U.S. Cl. 128—64 **14 Claims**



1. A ventricular assist device to be inserted through the pericardial sac which receives and stabilizes the position of a human heart, the assist device being in aligned position relative to the anterior interventricular line of the anterior descending coronary artery which marks the right and left ventricular surfaces, said assist device comprising:

(a) a shell formed of flexible and substantially inelastic material which forms a visible surface of the device, said shell having an open end margin defined by anterior superior and posterior inferior extremities;

(b) an inner elastic membrane sealed to said shell in position to form an internal lining for presenting surfaces in contiguous fixed relation to the ventricular heart surfaces, said membrane having a line of sealed attachment to said shell for separating said membrane into adjacent but noncommunicating spaces for the right and left ventricular surfaces;

(c) a wedge opening through said shell presenting spaced margins substantially relatively movable, said membrane having margins sealed to said spaced margins to complete the separation of said spaces, such spaced margins of said wedge opening presenting suturable flaps; and

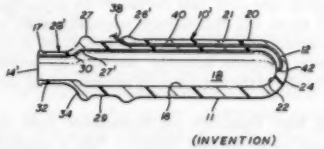
(d) means on said shell for suturing said shell directly to the normal heart enclosing pericardial sac, said suturing means being in a position in which said wedge opening is substantially aligned with the anterior decscending coronary artery for presenting said spaces to the right and left ventricular surfaces.

4,690,135

MALE IMPOTENCE PROSTHESIS

Frank J. Gerow, Houston, Tex., assignor to Synergist Limited, Houston, Tex.

Filed May 5, 1986, Ser. No. 859,459
Int. Cl.[4] A61F *5/41*
U.S. Cl. 128—79 **8 Claims**



(INVENTION)

1. An external device for accepting a male penis to its anatomic limit for overcoming impotence and permitting sexual intercourse, comprising:

a generally cylindrical hollow body member constructed of a flexible and elastic material for accommodating the penis and having distal closed end and a proximal open end, said body member having a first predetermined substantially constant inner circumferential measurement that is a function of the measured circumference of the erect penile shaft,

a sealing member integrally extending from said proximal open end of said body member and comprising

a flexible sleeve-like sealing portion having a second predetermined substantially constant inner circumferential measurement which is a function of the measured circumference of the stretched non-erect penile shaft, said second predetermined inner circumferential measurement being less than said first predetermined inner circumferential measurement, and

a flexible transition portion integrally interconnecting one end of said sleeve-like sealing portion and said open proximal end of said body member for positioning said sleeve-like sealing portion in concentric axial alignment with said body member,

said sleeve-like sealing portion having a wall thickness substantially less than the wall thickness of said body member and adapted to be rolled up over the open end of the thicker-walled body member to permit the distal end of the male penis to be inserted into said proximal open end of said hollow body member,

said second predetermined substantially constant inner circumferential measurement of said sealing member sleeve-like sealing portion selected for permitting said sealing portion to snugly contact the exterior surface of the non-erect penile shaft throughout the length of said sleeve-like sealing portion when returned to the unrolled extended position,

a length of flexible tubing at least a portion of which is disposed longitudinally in the wall of said body member, one end of said tubing communicating with the most distal end of the interior of the hollow body member, the other end of said tubing freely extending from said body member, and

means cooperating with said other end of said tubing for evacuating the air from the interior of said body member forward of the inserted penile end for exerting a negative pressure therein for permitting the male penis to expand to its anatomic limit in an erect condition into the interior of the hollow body member, said negative pressure exerted within said body member further acting on said thin-walled sleeve-like portion for collapsing said thin walls about the non-erect portion of the penile shaft in contact with said sealing portion for maintaining an air-tight seal therewith during movement of the penis with respect to said body member during intercourse but not engaging the non-erect penile shaft tightly enough to restrict venous blood flow therein.

4,690,136

ASSEMBLY OF INTRA-UTERINE CONTRACEPTIVE DEVICE AND INSERTOR

Willem A. A. A. van Os, Le Rouret, France, assignor to Akzo N.V., Arnhem, Netherlands

Filed Dec. 12, 1985, Ser. No. 807,980

Claims priority, application Netherlands, Dec. 21, 1984, 8403915

Int. Cl.[4] A61F *5/46*

U.S. Cl. 128—130 **5 Claims**

5. An attachment for use in an intra-uterine contraceptive device insertion assembly for carrying an intra-uterine contraceptive device into the uterine cavity, comprising an elongated member having a hollow section at least at one end thereof formed by a substantially cylindrical wall and wherein a portion of said cylindrical wall is removed to form an opening in the side thereof located at the hollow section near or immediately adjacent to the end of said member having the hollow section, the opening being of such a size and shape whereby the stem of a contraceptive device provided with a central stem that at one end merges into at least two flexible self-supporting arms can be introduced therein and removed therefrom, the edge of said opening being smooth and merging at or near the end of said member to form a bulbous end portion having a smooth end surface, whereby said insertor with the contraceptive device accommodated therein can easily be inserted into

the uterine cavity through the cervix, and wherein said bulbous end portion acts as a ramp for the contraceptive device as it is removed from the insertor and deposited into the uterine cavity, said hollow section having an interior adjacent to said opening opposite the end surface being of such a shape to accommodate the stem of said contraceptive device coaxially therein and to accommodate, in addition, the arms of the contraceptive device when extended along the length of the stem.

4,690,137

SUBSTANTIALLY TRIANGULAR SURGICAL DRAPE

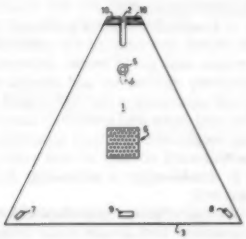
Martin Starzmann, Gothenburg, Sweden, assignor to Molnlycke AB, Gothenburg, Sweden

Filed Nov. 13, 1985, Ser. No. 797,832

Claims priority, application Sweden, Nov. 21, 1984, 84058650

Int. Cl.[4] A61B *19/08*

U.S. Cl. 128—132 D **3 Claims**



1. A surgical drape which is intended for surgical procedures on the urethra and which is adapted to be used in combination with a surgical sheet, which surgical sheet comprises a piece of material used to cover the torso and legs of a patient with the patient's legs raised and bent in a widely divergent attitude while the surgeon operates therebetween, characterized in that the surgical drape (1) has a substantially triangular shape; that an aperture (2) for the patient's penis is located in one corner of the drape; that a palpation stall (4) is located at a suitable distance from said one corner in a direction towards the side of the drape opposite said one corner; that said opposite side has a length in the order of 1.5 m and the remaining two sides of the triangle are of substantially the same length as the base; that fastening means (7,8,10) are provided in the

corners of the triangle, of which fastening means those (7,8) provided at the corners at the ends of said opposite side are adapted, subsequent to bringing the aperture (2) and the palpation stall (4) into their respective positions, to be secured to a said surgical sheet (11) in the vicinity of the lower extremities of the patient, so that the surgical drape (1) hangs from its three corners in the shape of a bowl.

4,690,138

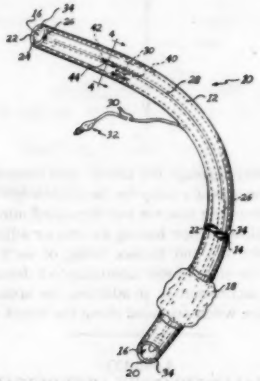
MARKING SYSTEM FOR TUBE PLACEMENT

Eugene L. Heyden, S: 627 Bernard, #8, Spokane, Wash. 99204

Continuation-in-part of Ser. No. 667,098, Nov. 1, 1984, Pat. No. 4,649,915. This application Nov. 3, 1986, Ser. No. 926,083

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.15 **21 Claims**



1. A marking system for indicating a correct placement depth of a tubular apparatus inserted within an anatomical pathway, said apparatus comprising an elongated tubular means including a wall with an inner wall surface and an outer wall surface, a forward portion and end for residing at a depth within said anatomical pathway, and a rearward portion and end for residing a distance outside said anatomical pathway, said marking system comprising:

guide means of longitudinal extent provided by the wall of said tubular means and adapted for positionally retaining an insert means, said guide means comprising a passage means recessively defined by said tubular means and an elongated wall separation in the wall of said tubular means leading from said outer wall surface to said passage means, said passage means and said wall separation in combination in the rearward portion of said tubular means and extending in combination a substantial distance toward said forward end;

insert means of longitudinal extend adapted for inclusion and slidable adjustment within said guide means, said insert means including a laterally projecting side member for extending within said wall separation, and also presenting a distinguishing means suitable for space-relating to a stationary reference means, said stationary reference means located apart from said apparatus and stationary with respect to a range of locations within said anatomical pathway;

whereby, said insert means may be included to said guide means and adjusted within the same as said side member extends within said wall separation, said side member suitable for manipulating said insert means along said guide means and into a position so that said distinguishing means may be space-related to said stationary reference means when said tubular means is inserted within said anatomical pathway to a desired depth, so that a continuation of the spaced relation between said distinguishing means and said stationary reference means indicates a continuation of a correct depth of placement of said tubular means within said anatomical pathway, and a substantial departure of the spaced relation between distinguishing means and stationary reference means indicates a departure from a correct depth of placement of said tubular means within said anatomical pathway.

4,690,139

DERMATOME PARTICULARLY USEFUL FOR SKIN-GRAFTING PURPOSES

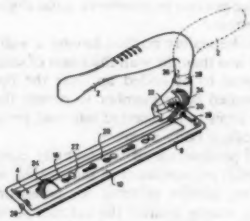
Lior Rosenberg, 13 Harduf Street, Omer, Beer-Sheva, Israel

Continuation of Ser. No. 588,778, Mar. 12, 1984, abandoned. This application Apr. 30, 1986, Ser. No. 869,830

Claims priority, application Israel, Mar. 22, 1983, 68193

Int. Cl.[4] A61B *17/322*

U.S. Cl. 128—305.5 **17 Claims**



1. A dermatome, comprising: a handle; a blade-mounting head for mounting a cutting blade; a guard for controlling the cutting depth; and adjusting means for effecting an angular displacement between aid guard and the blade of the mounting head for varying the cutting depth; said guard being carried by said blade-mounting head so as to be movable therewith during the reciprocation of the blade-mounting head and extending the complete length of the cutting edge of the blade; said guard being rounded at its opposite ends enabling the full blade length to be used during the reciprocation of the head, blade and guard across the skin to be cut by the blade; said blade-mounting head being formed with projections at the ends protecting the corners of the cutting edge of the blade against catching the skin during use of the cutting blade.

4,690,140

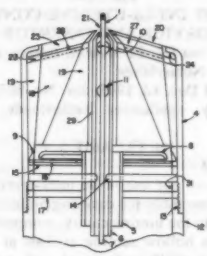
ARTERIAL REGENERATOR

John Mecca, 110 Whittier Dr., San Remo, N.Y. 11754

Filed Apr. 1, 1986, Ser. No. 846,727

Int. Cl.[4] A61B *17/32*

U.S. Cl. 128—305 **7 Claims**



5. A cutter head assembly mounted on the end of a catheter for use in the removal of deposits lining the interior wall of a blood vessel and the like, comprising:

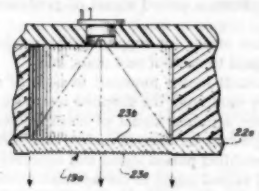
(a) non-rotating cylinder means having an outer wall fitted to the inside wall of said vessel;
(b) endoscopic tube means for lighting and viewing the region of said deposits adjacent said cutter head assembly, said endoscopic tube means extending from said catheter through said cylinder means and out through the end of said cylinder means facing said deposits to be removed;
(c) means for effecting the controlled movement of said endoscopic tube means in forward and reverse directions so as to permit selective viewing of the deposits to be removed;
(d) cutting means enclosed within the outer wall of said cylinder means on the end of the latter facing said deposits for rotation around said endoscopic tube means for dislodging said deposits;
(e) means for circulating clear liquid around said endoscopic tube means for exposing the region forward of said cutting means for viewing prior to and during cutting action of said cutting means;
(f) means within said cylinder means for bypassing a first portion of said clear liquid for use in causing rotation of said cutting means;
(g) means within said cylinder means for utilizing a second portion of said liquid to effect the entrapment and removal of deposits being dislodged by said cutting means; and
(h) said means for effecting movement of said endoscopic tube means including piston means actuated by a liquid for moving said endoscopic tube means.

4,690,141

FRESNEL LENS LIGHT APPLICATOR

John C. Castel, c/o Physio Technology, Inc., 1925 W. 6th St., Topeka, Kans. 66606, and Richard G. Kerwin, 1004 Elmhurst Rd., Prospect Hts., Ill. 60070

Filed Sep. 16, 1985, Ser. No. 776,354
Int. Cl.[4] A61N *5/00*; F21V *5/04*; G02B *3/08*
U.S. Cl. 128—396 **19 Claims**



1. A therapeutic laser radiation applicator comprising:
means for providing laser radiation in an elliptical transverse distribution; and
means for converting the elliptical transverse distribution of the laser radiation into a circular distribution thereof comprising at least two axially spaced fresnel lenses, and means for mounting the fresnel lenses in preselected association with said laser radiation means for refracting a portion of a laser radiation to said circular distribution adapted to provide a therapeutic tissue irradiation pattern.

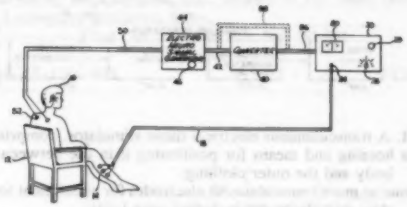
4,690,142

METHOD AND SYSTEM FOR UTILIZING ELECTRO-NEURO STIMULATION IN A BIO-FEEDBACK SYSTEM

Sidney A. Ross, 6901 Katherine Ave., Van Nuys, Calif. 91405, and Lyn P. Taylor, 18300 Subido, Rowland Heights, Calif. 91748

Filed Dec. 10, 1980, Ser. No. 215,027
Int. Cl.[4] A61N *1/08*
U.S. Cl. 128—419 R **39 Claims**

1. In a method for controlling the nervous system of a living organism, including the steps of (i) detecting at least one physiological signal from at least a first topological location on said organism; (ii) detecting at least one characteristic of interest in said physiological signal; and (iii) producing at least one output signal responsive to the detected characteristic of interest, the improvement comprising the steps of:
(a) generating at least one electro-neuro signal responsive to said at least one output signal;
(b) feeding back said electro-neuro signal to said organism by coupling the same to at least a second topological location on said organism, thereby producing a tactile sensation thereat; and



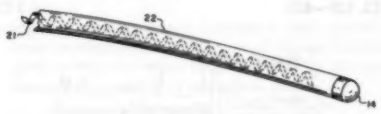
(c) causing said organism to concentrate mentally so as to vary said tactile sensation at said second topological location and training said organism to alter said characteristic of interest of said physiological signal by said concentration,
wherein at least one electrical characteristic of said electro-neuro signal is continually responsive to said at least one output signal, and said tactile sensation experienced by said organism continually varies as said electrical characteristic of said electro-neuro signal varies.

4,690,143

PACING LEAD WITH PIEZOELECTRIC POWER GENERATING MEANS

Edward A. Schroeppel, Miramar, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 632,457, Jul. 19, 1984, abandoned. This application Jan. 24, 1986, Ser. No. 822,694
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 P **7 Claims**

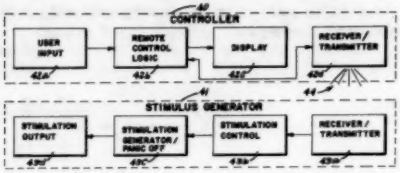


1. A pacing lead comprising a lead body having a distal end portion and a distal end, said lead body comprising a catheter having a given wall thickness and an interior lumen, a tip electrode mounted at the distal end of said lead body for providing electrical stimulus to a heart wall, a wire conductor in said catheter lumen extending the length of said catheter, being connected at one end to said tip electrode and being connectable at the other end to a pacer, piezoelectric electrical power generating means associated with said lead body distal end portion for generating electrical power in response to flexing movement of said pacing lead during contractions of the heart, within the heart and without any electrical power being supplied to said piezoelectric electrical power generating means, and electrical conducting means in said catheter coupled to said piezoelectric electrical power generating means and adapted to be coupled to a pacer for providing electrical power to the pacer.

4,690,144
WIRELESS TRANSCUTANEOUS ELECTRICAL TISSUE STIMULATOR

Mark T. Rise, Minneapolis, and David J. Stanton, Anoka, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 2, 1982, Ser. No. 364,660
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 R **9 Claims**

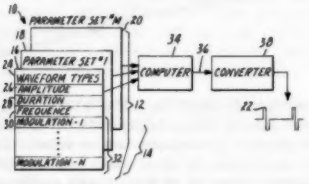


1. A transcutaneous electrical tissue stimulator, comprising:
a housing and means for positioning it in use between the body and the outer clothing;
one or more transcutaneous electrodes for attachment to the skin, said electrodes including wire leads;
stimulation generating circuit means for producing electrical stimulation and means for mounting it within said housing, said generating means electrically coupled to said electrodes through said leads;
said stimulation generating circuit means including means for receiving remotely generated programming signals and altering one or more modes or parameters of said electrical stimulation in response to said programming signals ; and
hand-sized remote control means including user actuated controls for generating and transmitting programming signals to be received by said receiving means to permit a user to control said stimulation generating circuit means from a position remote from the location of said housing.

4,690,145
OUTPUT LIMITED ELECTRICAL STIMULATOR FOR BIOLOGICAL TISSUE

Eric A. King-Smith, St. Louis Park; Walter J. ReMine, St. Paul, and Joel R. Dufresne, Vadnais Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 17, 1985, Ser. No. 745,084
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—421 **3 Claims**

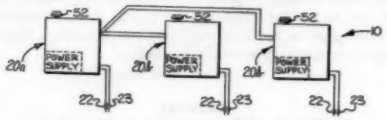


1. An electrical stimulator for biological tissus having output limits, comprising:
storage means for storing a plurality of sets of stimulus parameters designed to specify an electrical stimulus signal comprising a plurality of pulses each having a pulse amplitude and a pulse duration;
calculation means operatively coupled to said storage means for calculating the electrical charge which would be generated by each of said plurality of pulses contained in said electrical stimulus signal from said plurality of sets of stimulus parameters;
limit means having a stored predetermined standard for the maximum electrical charge to be delivered by each of said plurality of pulses, said limit means being operatively coupled to said calculation means for comparing said calculated electrical charge of said electrical stimulus pulse with a predetemined standard and adjusting at least one of said plurality of sets of stimulus parameters so that said electrical charge of said electrical stimulus signal would not exceed said predetermined standard;
generation means operatively coupled to said storage means, to said calculation means and to said limit means for taking at least one of said sets of stimulus parameteres as adjusted by said limit means and generating said electrical stimulus signal as designated by said and of said plurality of sets of stimulus parameters as adjusted.

4,690,146
NEUROMUSCULAR STIMULATING APPARATUS

Gad Alon, Rockville, Md., assignor to Chattanooga Corporation, Chattanooga, Tenn.

Filed Jun. 17, 1985, Ser. No. 745,577
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—422 **11 Claims**



6. A portable electrical neuromuscular stimulating apparatus comprising
a plurality of separate and individually portable electrical stimulation units, with each unit including at least one pair of electrodes adapted to be placed on the body of the patient,
pulse oscillator means mounted in one of said units for generating a reference pulsed signal of predetermined waveform,
electrical line means for supplying the resulting reference pulsed signal to each of said units, and
electrical circuit means mounted in each of said units for adjustably modifying the supplied reference pulsed signal to produce a pulsed signal of modified waveform, and including means mounted in each of said units for amplifying the modified pulsed signal and applying the resulting amplified pulsed signal to the associated electrodes.

4,690,147
METHOD AND APPARATUS FOR MEASURING GAS PARTIAL PRESSURE IN LIVING BODY

Akihiko Ooe, Komaki; Tetsuo Imaiida; Teruyoshi Uchida, both of Nagoya, and Hirotaka Kojima, Kasugai, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

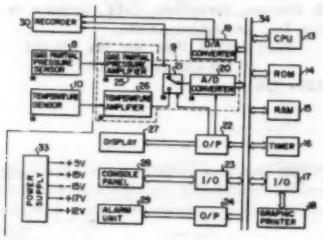
Continuation of Ser. No. 486,413, Apr. 19, 1983, abandoned. This application Jan. 2, 1986, Ser. No. 815,760
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—635 **9 Claims**

1. An apparatus for measuring a partial pressure of gas in a living body based on the principle of polarography comprising:
a gas partial pressure sensor including a biomedical electrode and a counter electrode for producing an output signal indicative of a polargraphic current, at least said biomedical electrode being placed in said living body wherein said biomedical electrode has a tip end surface covered with a membrane comprised of an outer dense, thin layer having fine pores of an average diameter of 20 Å to 0.7 μm and an inner porous layer, contigous to and integral with the outer layer, having fine pores of an average diameter of 0.7 μm or more,

a temperature sensor adapted to be placed at a position suitable for producing an output signal indicative of a temperature of said living body,

an interface unit having an A/D converter which digitizes the output signals from said partial pressure sensor and said temperature sensor,

an operation unit connected to said interface unit to receive the digitized values of the output signals of said gas partial pressure sensor and said temperature sensor, said operation unit correcting the digitized output signal of said gas partial pressure sensor to an output signal value at a reference temperature on the basis of the temperature measured by said temperature sensor, in accordacne with the following equation:



$$I_t = I_{ST}(k)^{T-t}$$

where I_t is the output value of the gas partial pressure sensor at t° C., I_{ST} is the output value of the gas partial pressure sensor at T° C., k is the temperature coefficient of the gas partial pressure sensor, and t is the temperature measured by the temperature sensor, and calculating a gas partial pressure on the basis of a working curve prepared in said operation unit in advance, said working curve representing a relationship between said gas partial pressure and said corrected digitized output signal of said gas partial pressure sensor.

4,690,148

SURFACE MAPPING ELECTRODE SETS

Stanley R. Hess, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 650,192, Sep. 13, 1984, abandoned. This application Jan. 16, 1987, Ser. No. 5,314

Int. Cl.⁴ A61B *5/04*

U.S. Cl. 128—639 **15 Claims**

1. A surface mapping electrode set assembly comprising:

a plurality of insulated elongated wires positioned generally longitudinally adjacent to each other, said plurality of elongated wires being included in both a head portion and a handle portion of the electrode set assembly;

each said insulated wire having a distal end embedded within the head portion of the surface mapping electrode set;

administration means on said head portion for contacting an organ to be mapped, said administration means including an insulated administration surface having a plurality of slits therethrough; and

each said elongated wire having at least one non-intrusive electrode fixed relative to said administration surface, each said electrode being a generally arcuate section of the respective elongated wire, said generally arcuate wire electrode being located on said head portion of the surface mapping electrode set and being aligned generally parallel to the portion of said respective elongated wire adjacent said wire electrode, and each said generally arcuate wire electrode extending through one of said slits of the administration surface and projecting beyond the administration surface.

4,690,149

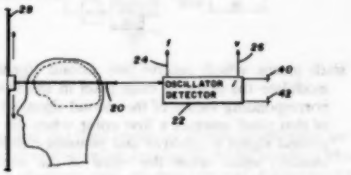
NON-INVASIVE ELECTROMAGNETIC TECHNIQUE FOR MONITORING PHYSIOLOGICAL CHANGES IN THE BRAIN

Harvey W. Ko, Columbia, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Oct. 28, 1985, Ser. No. 791,864

Int. Cl.⁴ A61B *5/05*

U.S. Cl. 128—653 **7 Claims**



1. A method for locating edematous tissue within the white or grey matter of an animal or human brain, comprising:

noninvasively detecting the impedance due to brain tissue and other biological matter at a plurality of localized portions within the brain, wherein said detecting step for each of said plurality of localized portions comprises the steps of:

a. producing an oscillating magnetic field that is spatially concentrated in a localized portion of a brain using a coil means, whereby eddy currents induce a secondary magnetic emission which alters the mutual inductance of said coil means in accordance with the impedance of brain tissue and other biological matter in said portion, and

b. measuring a change in the mutual inductance of said coil means, wherein an increase in mutual inductance indicates an increase in impedance and a decrease in mutual inductance indicates a decrease in impedance; and,

comparing the impedance detected at each portion of the brain to determine the location of higher impedance regions within the white or grey matter of the brain that indicate the location of edematous tissue.

4,690,150

PRODUCING PSEUDOCOLOR IMAGES FOR DIAGNOSTIC ULTRASOUND IMAGING

William T. Mayo, Jr., Seal Beach, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 20, 1985, Ser. No. 767,457

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—660 **8 Claims**

1. Ultrasound imaging apparatus comprising:

first means which direct a beam of ultrasound energy into a region of a body and which detect echoes of the energy which are reflected from structures within the body;

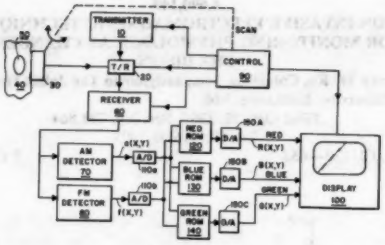
second means which process the detected echoes to produce a first signal, a(x,y), where x and y are spatial coordinates of the reflecting structures, which represents the instantaneous amplitude of the detected echoes;

third means which process the detected echoes to produce a second signal, f(x,y), which represents the deviation of the

instantaneous frequency of the echoes which originate from points x,y from a reference frequency, f_0;

fourth means which scan the beam with respect to the body and which produce an image wherein positions of pixels map corresponding spatial coordinates (x,y) in the body;

fifth means which receive the first signal and which modulate the intensity of each pixel in the image with corresponding values of the first signal; and



sixth means which receive the second signal and which modulate the color of each pixel in the image with the corresponding values of the second signal so that the hue of that pixel assumes a first color when the value of the second signal is positive and assumes a second complementary color when the value of the second signal is negative and which modulate the saturation of that pixel as a function of the corresponding absolute value of the second signal.

4,690,151

BLOOD PRESSURE MEASURING APPARATUS

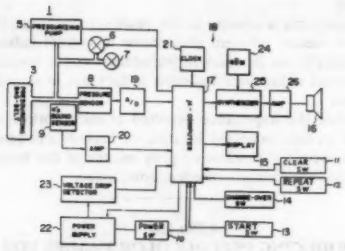
Shunji Utsunomiya, Kyoto; Tsutomu Teramoto, Takatsuki, and Tadashi Huruta, Ohtsu, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 22, 1985, Ser. No. 800,963

Claims priority, application Japan, Nov. 22, 1984, 59-247340

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—682 **2 Claims**



1. In a blood pressure measuring apparatus for measuring maximum and minimum values of blood pressure, comprising a bag-like arm belt for compressing an arm of a person whose blood pressure is to be measured, a power source switch, pressurizing means for pressurizing interiorly said bag-like belt, pressure detecting means for detecting pressure within said bag-like belt, information detecting means for detecting blood information in the course of decreasing of the pressure within said bag-like belt, blood pressure determining means for determining maximum and minimum values of the blood pressure on the basis of output signals of said pressure detecting means and said information detecting means,

a combination comprising; pressure setting means for setting a pressure value to be established within said bag-like belt, pressure increasing means for increasing the pressure within said bag-like belt to said set pressure value, announcing means for announcing said set pressure value in the form of speech information upon closing of said power source switch, to thereby issue said set pressure value in the form of speech information, before the pressurizing operation is effected.

4,690,152

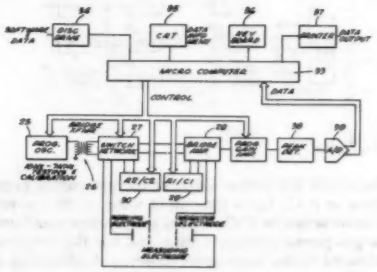
APPARATUS FOR EPITHELIAL TISSUE IMPEDANCE MEASUREMENTS

Robert D. Juncosa, Santa Ana, Calif., assignor to American Mediscan, Inc., Los Angeles, Calif.

Filed Oct. 23, 1985, Ser. No. 790,491

Int. Cl.[4] H61B *5/05*

U.S. Cl. 128—734 **1 Claim**



1. Apparatus for use in effecting epithelial tissue impedance measurements within a test subject, comprising:

a first probe having first and second annular electrodes arranged in spaced relation by an intervening insulative member;

first and second lead wires having an end connected respectively to the first and second annular electrodes;

a second probe leaving third and fourth electrodes with lead wires connected thereto;

bridge circuit means interconnected with the lead wires of the first and second probe electrodes having a first stage configuration including a source of oscillatory voltage with two terminals, a lead wire interconnecting the first electrode with one terminal of the oscillatory voltage source, a selectively variable resistance-capacitance impedance means interconnected between the oscillatory voltage source other terminal and the second probe fourth electrode, the second and third electrodes connected as separate inputs to a first differential amplifier having an input impedance greater than that of the tissue impedance, a balancing amplifier having its input interconnected with the oscillatory voltage source other terminal and its output fed into a second differential amplifier, lead means interconnecting the first differential amplifier output with the second differential amplifier input, the second differential amplifier output connected to a digitizing means, said digitizing means forming a digital signal fed into a microcomputer to vary the resistance-capacitance impedance means to a value corresponding to the impedance of the epithelial tissue; and

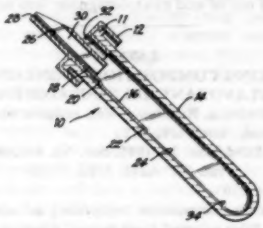
means responsive to microcomputer control for adjusting the resistance-capacitance impedance means to remove error impedances associated with cabling, internal equipment and circuit sources.

4,690,153

FLOW INDUCING MEANS FOR SMALL VOLUME CONTAINERS

Robert J. Losada, Astoria, N.Y., and Hugh T. Conway, Verona, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 29, 1985, Ser. No. 803,050
Int. Cl.[4] A61B 5/14
U.S. Cl. 128—763 **7 Claims**



1. A collector for use on a blood microcollection container which collector avoids capillary blood flow, comprising

(a) a collector body having a blood flow passage therethrough;

(b) the bottom surface of said blood flow passage being the blood flow surface of said blood flow passage;

(c) a blood source engaging front end surface on said body;

(d) a blood discharge rear end surface on said body;

(e) said body extending from said blood source engaging front end surface to said blood discharge rear end surface;

(f) means on said body for attaching said body to a microcollection container;

(g) vent means in said body for air displacement therethrough;

the improvement characterized by

(h) an elongated solid blood flow inducing member positioned along said blood flow surface of said blood flow passage;

(i) the forward end of said member positioned midway between said front end surface and said blood discharge rear end surface of said blood flow passage; and

(j) the rear end of said member extending beyond said blood discharge rear end surface.

4,690,154

VENTED SYRINGE

Timothy Woodford, and John Cheraso, both of 795 Northlake Blvd., North Palm Beach, Fla. 33408

Filed Jun. 3, 1985, Ser. No. 740,514
Int. Cl.[4] A61B 5/14
U.S. Cl. 128—765 **13 Claims**

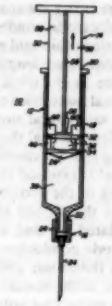
1. A syringe of a type used to obtain a specimen of blood for blood gas analysis comprising:

a hollow cylinder providing a specimen chamber adapted to having a hollow needle, of the type for insertion into an artery, affixed to one end thereof in fluid communication therewith, said cylinder having an inner surface;

a plunger slideably positioned within said inner surface of said cylinder, said plunger including a handle and a piston, and at least one radial rib around said piston in movable contact with said inner surface, said piston having an inner end adjacent said needle, an external end connected to said handle, and an unbroken peripheral piston surface;

a plurality of air passage and fluid restricter means through said plunger sized to allow air to flow and to restrict the flow of blood in a direction from said specimen chamber and to restrict the flow of blood through said air passage and fluid restricter means to said external end of said piston remote from said specimen chamber and out past said handle, said air passage and fluid restricter means formed between said inner end and said external end of said piston; and

valve and seat means in fluid communication with said air passage and fluid restricter means and positioned on said piston remote from said specimen chamber to prevent air from flowing through said air passage and fluid restricter means into said specimen chamber;



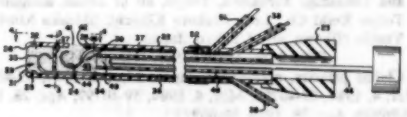
said air passage and fluid restricter means for allowing air to flow out of said chamber leaving blood by blocking blood flow out through said air passage and fluid restricter means each said air passage and fluid restricter means having a generally straight channel constructed and sized of substantially small cross section of a length to prevent blood, a liquid from flowing therethrough and allow air, a gas to flow therethrough.

4,690,155

MONOPHASIC ACTION POTENTIAL RECORDING LEAD

Stanley R. Hess, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 752,141, Jul. 3, 1985, abandoned. This application Dec. 24, 1986, Ser. No. 945,242
Int. Cl.[4] A61N 1/04
U.S. Cl. 128—786 **5 Claims**



1. A monophasic action potential contact electrode catheter, comprising:

an elongated tubular body having a longitudinal lumen therethrough, said elongated tubular body having a proximal portion and a distal end, said proximal portion including a plurality of terminal assemblies;

a compartmentalized tip portion extending from said distal end of the tubular body, said compartmentalized tip portion including a generally cylindrical wall member;

said compartmentalized tip portion includes a distal tip compartment having a circumferential surface and a proximal compartment having a circumferential surface, said distal tip compartment circumferential surface and said proximal compartment circumferential surface being substantially coextensive and defined by said generally cylindrical wall member, said distal tip compartment and said proximal compartment being electrically insulated from each other, said distal tip compartment having an opening at its distal end, and said proximal compartment having an opening in its said circumferential surface;

a tip electrode within said distal tip compartment and including an uninsulated length of a first electrically conductive wire in electrical communication with one of said terminal assemblies of the proximal portion of the tubular body, said tip electrode including a conductor-loaded material that is an injected and set resin or polymer plug that substantially fills said distal tip compartment and that is exposed through said distal end opening of the distal tip compartment, said uninsulated length of the first electrically conductive wire being encapsulated by and embedded within said tip electrode conductor-loaded material;

a lateral surface electrode within said proximal compartment and including an uninsulated length of a second electrically conductive wire in electrical communication with another of said terminal assemblies of the proximal portion of the tubular body, said lateral surface electrode including a conductor-loaded material that is an injected and set resin or polymer plug that substantially fills said proximal compartment and that is exposed through said circumferential surface opening of the proximal compartment, said uninsulated length of the second electrically conductive wire being encapsulated by and embedded within said lateral surface electrode conductor-loaded material;

each of said plugs is a thermoset and chlorodized resin or polymer that is filled with conductive particles substantially throughout the respective volumes of the plugs, said plug of the tip electrode defines a sealed interface of the tip electrode along said distal end opening, and said plug of the proximal electrode defines a sealed interface of the lateral surface electrode along said circumferential surface opening; and

a non-conductive separator member within said compartmentalized tip portion, said non-conductive separator member defining said distal tip compartment and said proximal compartment and electrically insulating said distal tip compartment from said proximal compartment, said non-conductive separator member being substantially disk-shaped and being transversely positioned within said generally cylindrical wall member.

4,690,156

APPLICATOR FOR LOCALIZED HYPERTHERMIA BY ELECTROMAGNETIC WAVES

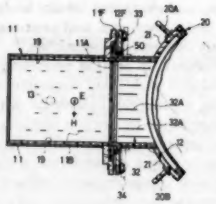
Makoto Kikuchi, 16-9, Inokashira 1-chome, Mitaka-shi, Tokyo; Shinsaku Mori, 31-6, Okusawa 1-chome, Setagaya-ku, Tokyo; Yoshio Nikawa, 26-14, Nerima 2-chome, Nerima-ku, Tokyo, and Takashige Terakawa, Tokyo, all of Japan, assignors to Tokyo Keiki Co., Ltd.; Makoto Kikuchi; Shisaku Mori and Yoshio Nikawa, all of Tokyo, Japan

Filed Mar. 1, 1985, Ser. No. 707,445

Claims priority, application Japan, Mar. 4, 1984, 59-40797; Mar. 4, 1984, 59-40798; Mar. 4, 1984, 59-40799; Apr. 28, 1984, 59-86921; Apr. 28, 1984, 59-86922

Int. Cl.[4] A61N *5/00*

U.S. Cl. 128—804 **16 Claims**



1. An applicator for applying a heating treatment to a body comprising:

a. a waveguide case for guiding electromagnetic waves towards said body;

b. an electromagnetic wave feed section formed at one end of said waveguide case for feeding said electromagnetic waves towards said body;

c. an opening formed at a second end of said waveguide case for delivering said electromagnetic waves to said body;

d. an electromagnetic lens section positioned in said waveguide case between said electromagnetic feed section and said opening for focusing said electromagnetic waves towards said body; and

e. a coolant liquid circulation system connected to said electromagnetic lens section for circulating coolant liquid into and out of said electromagnetic lens section.

4,690,157

SMOKING COMPOSITIONS CONTAINING A FLAVORANT-RELEASE ADDITIVE

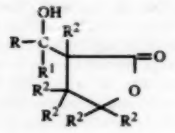
Kenneth F. Podraza, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 21, 1986, Ser. No. 842,695

Int. Cl.[4] A24B *3/12, 15/40*

U.S. Cl. 131—276 **12 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and tobacco substitutes, and (2) between about 0.0001–5 weight percent, based on the total weight of filler, of a flavorant-release additive corresponding to the formula:



where R is an aromatic substituent containing between about 4–10 carbon atoms; and R^1 and R^2 are substituents selected from hydrogen and aliphatic, aromatic and alicyclic radicals containing between about 1–10 carbon atoms.

4,690,158

WASHING APPARATUS

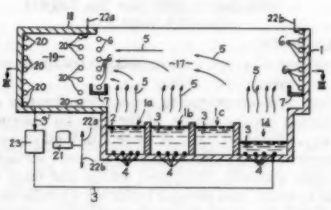
Yosuke Yamada, Funabashi, and Mitsuhiro Oogami, Chiba, both of Japan, assignors to Daiwa Special Chemical Co., Ltd., Osaka, Japan

Filed Jan. 29, 1985, Ser. No. 696,122

Claims priority, application Japan, Feb. 16, 1984, 59-28305

Int. Cl.[4] B08B *3/10*

U.S. Cl. 134—107 **5 Claims**



1. A washing apparatus for washing and drying articles with a volatile organic washing liquid, which comprises:

an upright vessel having a bottom wall and an upright circumferential wall defining a working bath in the lower portion thereof, partition means dividing said working bath into a plurality of washing baths each adapted to contain a volatile liquid organic solvent, heating means in at least one of said washing baths for vaporizing said solvent, said vessel having an upper main chamber there-

within above said washing baths for receiving vapor of said solvent from said washing baths;

a first condenser coil facing said upper main chamber and defining the perimeter thereof, said first condenser coil being arranged so that the convolutions of said first condenser coil form a vertical array with interstices being provided between adjacent convolutions of said first condenser coil,

said vessel having wall means defining a suction chamber which extends horizontally outwardly from said upper main chamber at the same vertical height as said first condenser coil, said suction chamber being open along the horizontally inner side thereof whereby vapor of said solvent can flow through the interstices between adjacent convolutions of said first condenser coil and thence into said suction chamber;

a second condenser coil disposed in said suction chamber at the same vertical height as and horizontally outwardly offset from said first condenser coil, said second condenser coil being arranged so that the convolutions of said second condenser coil form a vertical array, corresponding portions of the convolutions of said second condenser coil being spaced horizontally outwardly from, in parallel with and being directly opposed to corresponding portions of the convolutions of said first condenser coil so that the vapor of said solvent that flows into said suction chamber flows in contact with said second condenser coil; and

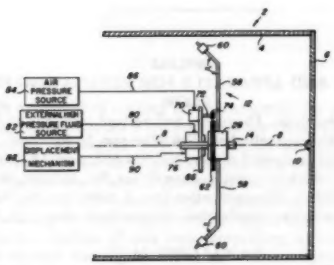
cooling means connected for receiving coolant discharged from said first and second condenser coils, then cooling said coolant and then separately returning different portions of said coolant to said first and second condenser coils to maintain the temperature in said suction chamber lower than the temperature in said upper main chamber, whereby the solvent vapor evolved from said working bath is substantially completely condensed in said upper main chamber and said suction chamber.

4,690,159

ROTARY CLEANING DEVICE

Thomas C. Vadakin, and Thomas A. Hoenigman, both of Marietta, Ohio, assignors to Vadakin, Inc., Marietta, Ohio

Filed Dec. 17, 1985, Ser. No. 809,718
Int. Cl.[4] B08B 9/02
U.S. Cl. 134—167 C **11 Claims**



1. Apparatus for cleaning the inner surface of a cylindrical housing such as a cyclone furnace, a horizontally oriented tank, and the like, comprising

(a) a fixed support connected with the ends of the housing and extending along the axis thereof;

(b) a cylindrical shaft containing

(1) an axial through-bore adapted to receive said support, said shaft being axially displaceable relative to the fixed support;

(2) an elongated annular passage concentrically arranged relative to and isolated from said through-bore; and

(3) inlet and outlet opening means affording communication with said passage;

(c) an elongated generally cylindrical insert member arranged within said cylindrical shaft through-bore, said insert member containing a longitudinal through-bore adapted to receive said support, said insert member having end portions the outer diameter of which corresponds with the inner diameter of said shaft, said insert member further having an intermediate portion the outer diameter of which is less than the outer diameter of said end portions, said intermediate portion extending at least between said shaft inlet and outlet opening means, thereby to define said annular passage between the inner surface of said shaft and the outer surface of said insert member intermediate portion;

(d) cleaning means extending radially from said shaft and in communication with said passage via said outlet opening means, each of said cleaning means including a rigid lance and a nozzle connected with the end of said lance, said nozzle being arranged adjacent the surface to be cleaned;

(e) means for rotatably connecting said cleaning means with said shaft;

(f) drive means connected with said cleaning connecting means for rotating said connecting means about said shaft; and

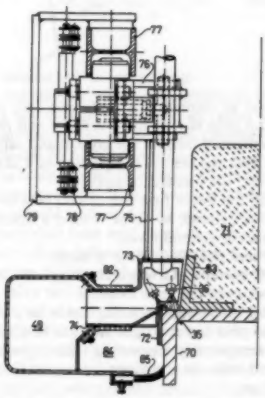
(g) means connected with said inlet opening means for supplying a cleaning fluid to said cleaning means via said passage, whereby when said drive means are operated to rotate said cleaning means and when said shaft is axially displaced along said support, said nozzles traverse both orbital and linear paths to direct said cleaning fluid against the entire interior surface of all of the cylindrical housing.

4,690,160

HYDRAULICALLY OPERATED HIGH-PRESSURE PISTON PUMP

Norbert Walther, Recklinghausen; August Lucas, Datteln-Horneburg; Kurt Lorenz, Hattingen, and Engelbert Bruns, Recklinghausen, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 28, 1985, Ser. No. 695,443
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1984, 3402920; Oct. 27, 1984, 3439457; Oct. 27, 1984, 3439458
Int. Cl.[4] B08B 3/02
U.S. Cl. 134—181 **7 Claims**



7. A coke oven door and cleaning apparatus combination for cleaning a sealing surface of the coke oven door, comprising, a coke oven door having an annular sealing surface, means defining a generally rectangular sealing surface trackway around said sealing surface of said coke oven door, a support structure

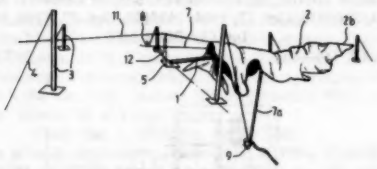
adjacent said sealing surface having a sliding support surface trackway adjacent said door, a sliding support movable over said support surface trackway, a nozzle lance carried on said support and having one end with a nozzle directed at said sealing surface and an opposite end having a cleaning liquid connection, a highpressure liquid nozzle including a cowl for exhausting a mist of liquid and dirt which is supported for movement along said trackway for moving the nozzle along said surface to be cleaned, a second sliding support arranged at spaced locations around said trackway from said first mentioned sliding support, each sliding support having a high pressure nozzle lance with a liquid nozzle discharge directed at said sealing surface, each device including a cowl for exhausting the mist of liquid and dirt and a flexible line connection to each cowl for connecting each cowl and its lance to a high-pressure liquid source, an exhaust duct having the shape of a frame which is displaceable toward said sealing surface to be cleaned, said exhaust duct having a sealing opening facing said sealing surface, each cowl having a projecting connection which protrudes into and is displaceable along the sealing opening of said exhaust duct in the longitudinal direction thereof, means sealing said projecting connection to said exhaust duct including elastic sealing elements, a further seal connected to said exhaust duct and engaged against said coke oven door for sealing said exhaust duct to said coke oven door, and a collecting tube connected below said coke oven door for collecting water and solid matter which is directed off said door by said cleaning apparatus.

4,690,161

METHOD AND DEVICE FOR MOUNTING THE POLE AND CLOTH OF A LIGHT SHELTER WITH CENTRAL POLE

Jean Dalo, Rue Beaurepaire, 91410-Roinville-sur-Dourdan, and Pierre Dalo, 153, rue de Fleury, 92140-Clamart, both of France

Filed Jun. 19, 1985, Ser. No. 746,270
Claims priority, application France, Jun. 21, 1984, 84 09766
Int. Cl.[4] E04H *15/00, 15/26*
U.S. Cl. 135—99 **7 Claims**



1. A method of mounting a tent, said tent comprising a vertical, central pole having its lower first end pivotably supported on a stationary base on the ground and supporting at its upper second end, the central top portion of a cloth forming a roof of said tent, the method comprising:

(a) mounting the lower first end of said pole on a stationary base on the ground, to pivot around a horizontal axis at approximately ground level;

(b) placing said pole flat on the ground;

(c) attaching one end of a single hoisting cable to said pole at a point between the ends thereof;

(d) extending said single hoisting cable in a vertical plane along said pole and at a right angle to said horizontal axis;

(e) at least temporarily supporting said single hoisting cable above said base, on a stationary support fixedly attached to said base;

(f) engaging the other end of said single hoisting cable to a cable pulling device;

(g) anchoring said cable pulling device to the ground;

(h) slipping a cloth over said pole to position said central, top portion of the cloth on said upper second end of said pole;

(i) pivoting said pole carrying the cloth around said horizontal axis until said pole has reached the vertical position; and

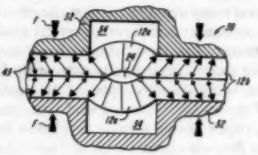
(j) controlling the ascent of said pole by said single cable and said cable pulling device.

4,690,162

METHOD AND APPARATUS FOR REGULATING FLUID FLOW

James E. Lyddy, 122 Claremont Ave., Arlington, Mass. 02174, and Randall W. Fincke, 23 Chisholm Rd., Winchester, Mass. 01890

Filed Sep. 30, 1985, Ser. No. 782,552
Int. Cl.[4] E03B *1/00;* **F16K** *55/14*
U.S. Cl. 137—1 **31 Claims**



1. A method for producing a time-stable orifice within a deformable tubing with a fluid flow through said orifice comprising thesteps of

placing the inner surfaces of at least a first portion of the tubing into contact with one another in a plane of contact, and

generating a compressive stress within the walls of the contacting tubing portions that causes a second portion of the tubing walls adjacent the first portion to curve away from said plane of contact to form said orifice, said compressive stress being of a value that the net stresses within the tubing wall that defines said orifice are generally in equilibrium after said curvature, wherin an increase in said compressive stress increases the flow rate of said fluid through said orifice and a decrease in said compressive stress decrease said flow rate.

4,690,163

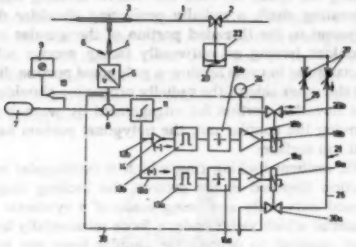
METHOD AND APPARATUS FOR REGULATING FLUID FLOW

Robert Steinemann, Thayngen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Continuation-in-part of Ser. No. 854,663, Apr. 18, 1986, abandoned, which is a continuation of Ser. No. 653,694, Sep. 21, 1984, abandoned. This application Dec. 8, 1986, Ser. No. 938,812
Claims priority, application Switzerland, Sep. 27, 1983, 5221/83
Int. Cl.[4] G05D *16/20*
U.S. Cl. 137—8 **10 Claims**

1. A method for regulating the flow and/or the pressure of a fluid medium comprising the steps of measuring the actual value of the flow volume or the pressure of said fluid medium, generating an analogous signal representative of said actual value and a signal representative of a desired value, comparing said actual value signal and said desired value signal and generating from said comparison an analogous differential signal, generating electrical control signals comprising two parallel analogous signals derived from said analogous differential signal, reversing one of said signals, applying said control signals as individual pulse signals having a frequency propor-

tional to the value of said analogous differential signal, amplifying said control signals and applying said amplified control



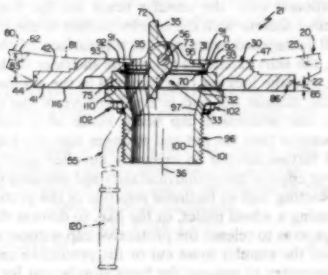
signals to control one of the pressure and rate of flow of said fluid medium.

4,690,164

VALVE ASSEMBLY AND METHOD OF MAKING SAME

John F. Gardner, Loveland, and Gerald H. Morton, Cincinnati, both of Ohio, assignors to Xomox Corporation, Cincinnati, Ohio

Filed Nov. 8, 1984, Ser. No. 669,598
Int. Cl.[4] F16K *51/00*
U.S. Cl. 137—15 13 Claims



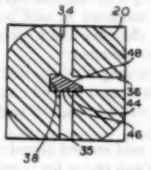
1. In a method of making a valve assembly for a fluid-containing tank which has a mounting saddle fixed to the bottom portion thereof, said method comprising the steps of, providing a housing structure having a fluid inlet and a fluid outlet defined therein, said inlet and said outlet being interconnected by a flow passage therebetween, providing means for mounting said housing structure against said saddle and substantially within the confines of said tank, supporting bottom operable means on said housing structure, said bottom operable means being movable between an open position thereof and a closed position thereof to shut off fluid flow through said flow passage, said inlet and said outlet being defined in said housing structure on a common rectilinear flow axis which is the central axis of said flow passage, said supporting step comprising supporting said bottom operable means so that it has its closed position at a location between said inlet and said outlet, said bottom operable means once moved to said open position enabling substantially free unobstructed flow of fluid through said valve assembly parallel to said axis and with minimum pressure drop to thereby enable a maximum rate of fluid transfer through said valve assembly, the improvement in said method wherein said step of providing said housing structure comprises providing said inlet of said housing structure which is adapted to provide complete drainage of fluid within said tank once said housing structure is mounted on said tank employing said mounting means, said tank having an inside surface with said saddle having an innermost surface which blends smoothly with a lowermost portion of said inside surface, said step of providing said housing structure comprises providing said housing structure having said inlet which is adapted to be disposed with respect to said innermost surface and lowermost portion to enable said complete drainage by gravity, said saddle having a maximum thickness, said step of providing said housing structure comprises providing said housing structure which has a thickness over the major portion thereof when viewed parallel to said flow axis which is substantially equal to said maximum thickness, and said step of providing said housing structure also comprises providing said housing structure with a comparatively small downwardly extending portion which extends beneath a bottom annular projection of said mounting saddle with said housing structure mounted in position against said saddle, said downwardly extending portion being sufficiently small to preclude the need for a protective skid for said valve assembly when using same as a lading valve of a railway tank car.

4,690,165

MIXING TEE CHECK VALVE AND METHOD

Lev J. Leytes, Palo Alto, and Harry A. Penhasi, Cupertino, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 676,126, Nov. 29, 1984, abandoned.
This application Aug. 20, 1986, Ser. No. 898,867
Int. Cl.[4] F16K *15/14*
U.S. Cl. 137—112 6 Claims



1. A fluid mixing valve, comprising:

a housing defining a central valve chamber, for connecting at least a pair of inlet ports with an outlet port, said inlet ports converging into said valve chamber substantially perpendicular to said outlet port;

a valve core body having an exterior shape which conforms to the interior shape of said valve chamber and having passages aligned with said inlet and outlet ports and providing a conduit from said ports to a cavity in said valve core body which defines valve seats at the interior end of the passages within said cavity, said cavity adapted to receive valve seal means;

a deformable valve seal means compressibly held within and substantially filling said cavity in said valve core body and sealing against said valve seats at the interior ends of said inlet ports closing said inlet ports to said outlet port in said valve core body when fluidic pressure in each of said inlet ports is less than a predetermined pressure, said seal means deforming in response to increase in fluidic pressure in either of said inlet ports to permit fluid communication through said cavity from the pressurized inlet port to said outlet port while sealing the other inlet port during fluid flow, said seal means recovering to substantially fill said

cavity in said valve core body and seal against said valve seats at the interior ends of said inlet ports closing said inlet ports to said cavity and from each other when fluidic pressure is relieved in said inlet ports to a point below said predetermined pressure; and

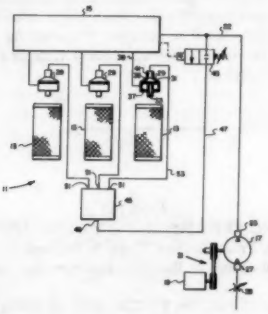
closure means for seating and enclosing said valve core body in the valve chamber in said housing.

4,690,166

PRESSURE DEPENDENT DUST CONTROL FILTER COMPRESSED AIR REVERSED FLUSHING CONTROL SYSTEM

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Filed Jul. 19, 1985, Ser. No. 757,010
Int. Cl.[4] B01D *46/04*
U.S. Cl. 137—119 **12 Claims**



1. A sequencing valve for sequentially opening a plurality of flushing valves of compressed fluid flushing system, which comprises:

a valve body having a cylindrical bore;

a piston slidingly mounted in said bore and dividing said bore into a first chamber and a second chamber;

an inlet to said first chamber;

an outlet for discharging air from said first chamber;

a plurality of inlets to said second chamber;

a normally closed valve in each of said inlets to said second chamber;

means for venting said second chamber;

operator means on said piston for opening one of said valves in said inlets to said second chamber;

means for biasing said piston toward said first chamber;

and means for rotating said piston in response to axial movement of said piston within said bore, whereby said operator means sequentially opens said valves in said inlets to said second chamber in response to fluid pressure received at said inlet to said first chamber.

4,690,167

FIREPLUG ANTI-THEFT APPARATUS

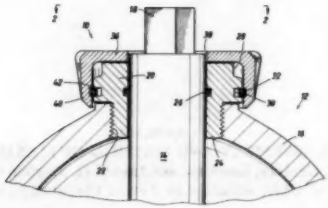
Claud Skipper, Willis, Tex., assignor to Productive Instrument & Machine Inc., Houston, Tex.

Filed Jul. 21, 1986, Ser. No. 887,736
Int. Cl.[4] F16B *33/00*
U.S. Cl. 137—382 **1 Claim**

1. In combination with a fire plug having an upstanding hollow housing with an axially threaded opening therein and a protruding valve operating shaft extending through the axially threaded opening in radial spaced relation therewith, wherein the shaft has a lug extending therefrom for engagement by an operating wrench;

an annular nut made of brass and having a cylindrical bore through which passes the valve operating shaft, the cylindrical bore having a seal therein for engaging the valve operating shaft, the annular nut including an externally threaded portion threadably engaged with the axially threaded opening in the hollow housing and substantially filling the space between the hollow housing and valve operating shaft, a radially projecting shoulder directly adjacent to the threaded portion of the annular nut, the shoulder having an outwardly facing groove which is rectangular in cross section; a polygonal portion disposed on the other side of the radially projecting shoulder from the threaded portion for engagement by wrench for removing the annular nut, the polygonal portion having a flat top surface;

a split, resilient locking ring which is rectangular in cross section disposed in the groove, the locking ring being biased outwardly and being made of a synthetic plastic material which yields under a force substantially less than that required to deform the annular brass nut so as to protect the annular brass nut from damage;



a protective cap having an annular top wall with a planar interior surface and a cylindrical skirt projecting downwardly therefrom with an interiorly facing groove of a rectangular cross-section therein, the protective cap being positioned over the annular brass nut for free rotation relative thereto with the interior surface of the annular top wall juxtaposed with the flat top surface of the annular nut, the skirt extending below the shoulder of the annular nut, and the locking ring disposed in the external groove of the annular nut and internal groove of the protective cap, the protective cap being made of a material less expansive than the nut and stronger than the locking ring and further having an inwardly bevelled portion on the lower edge of the cylindrical skirt and plurality of radially protecting lugs to facilitate removal of the protective cap by using a wheel puller, or the like, to deform the locking rings so as to release the protective cap without damaging either the annular brass nut or the protective cap when it is necessary to remove the brass annular nut for servicing the hydrant.

4,690,168

VALVE ACTUATOR POSITION INDICATING SYSTEM

Joe A. Kihm, Churchville, Pa., assignor to Harold Beck & Sons, Inc., Newtown, Pa.

Filed Oct. 16, 1984, Ser. No. 661,575
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—554 **8 Claims**

1. A valve actuator for controlling and sensing the rotational position of a valve member comprising:

an actuator motor for rotating an actuator shaft;

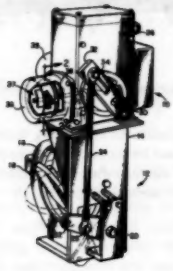
an actuator arm coupled to said actuator shaft, the rotation of said actuator shaft causing rotation of said actuator arm through an angle exceeding 90°;

a linkage connecting said actuator arm to said valve mechanism, the rotation of said actuator arm causing movement of said linkage and, in turn, rotation of said valve member; and

a positional indicator means or sensing the angular position of said actuator shaft, said positional indicator means including:

a positional indicator shaft coupled to said actuator shaft such that angular rotation of said actuator shaft causes a corresponding angular rotation of said positional indicator shaft;

a rotor/stator assembly including a rotor coupled to a said indicator shaft whereby said rotor includes a magnetically active sector located about a portion of the peripheral surface of said rotor, and a magnetically inactive sector located about another portion of the peripheral surface of said rotor; and



a stator comprising a first sensing pole piece partially surrounding said rotor, a second sensing pole piece partially surrounding said rotor, and a driving pole piece, said rotor being mounted for rotation with respect thereto, said rotor varying the inductive coupling in the stator; and

a positional indicator circuit responsive to said rotor/stator assembly for generating an analog output signal which varies in accordance with the angular position of said rotor with respect to said stator and, therefore, in accordance with the angular position of said actuator shaft.

4,690,169

COMBINED SHUT OFF AND CHECK VALVE

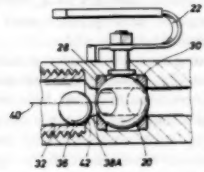
Benjamin L. Jobe, Houston, Tex., assignor to Jogler, Inc., Houston, Tex.

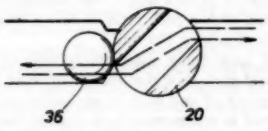
Continuation-in-part of Ser. No. 848,241, Apr. 4, 1986. This application Jun. 13, 1986, Ser. No. 873,943

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.[4] F16K *15/18*

U.S. Cl. 137—614.16 **4 Claims**





1. A combined shut off and check valve, comprising

a valve housing for horizontal installation having a bore therethrough,

a ball closure having a flow hole therethrough, said ball closure being mounted for swivelly opening and closing said bore,

said housing including a chamber on the upstream side of said ball closure and having an upstream opening,

an appropriate seat at the downstream end of said chamber, and

a ball confined in said chamber, the center of said ball being below the central axis of said flow hole when said ball rests on the lower side of said chamber during normal operating pressure differential across said ball closure, an abnormally high operating upstream-to-downstream pressure causing said ball to seat in said seat at the downstream end of said chamber,

wherein said ball closure has a stable part-open swivel position such that reverse flow can proceed through said flow hole of said ball closure and around said ball, said flow hole being at an angle sufficient to prevent said ball from seating in the event of reverse flow interruption.

4,690,170

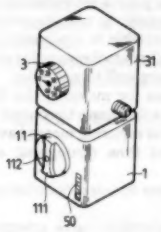
SAFETY GAS VALVE WITH TIMER

Tzong D. Tsai, No. 143, Hsin Sheng Street, Feng Shan City, Kaohsiung, and Tsang J. Tsai, No. 233, Sec. 2, Ta Tung Road, Tainan, both of Taiwan

Filed Jul. 23, 1986, Ser. No. 888,339

Int. Cl.[4] F16K *24/01*

U.S. Cl. 137—624.11 **3 Claims**



1. A safety gas valve having a timer comprising:

a valve;

a timer mounted on said valve, said valve including;

a valve body provided with a slot, a tapered recess at the central portion thereof and a vertical through hole;

a rubber cup disposed within the recess of said valve body, said rubber cup having two holes in alignment with said vertical through hole;

a plug having a tapered end received in the recess of said valve body, said tapered end having a vertical through hole aligned with the vertical through hole of said valve body, each end of the through hole of said plug being provided with a ferrule;

a ball disposed into said through hole of said plug;

a push rod inserted into said plug for separating said ball from said ferrule;

a positioning spring located on said plug for biasing said plug into said valve body;

a knob threadedly engaged with said push rod;

a compressed spring in contact with said positioning spring for biasing said knob away from said valve body;

a packing disposed between said compressed spring and the positioning spring and rigidly mounted within said plug;

a pitot tube in communication with the vertical through hole of said valve body;

said timer including,

a set of timing gears;

a notched disc operatively connected with said set of timing gears and pivoted at center thereof;

an actuating arm pivoted at one end, said actuating arm having a protuberance constantly in contact with circumference of said notched disc;

a hitting rod operatively connected with said set of timing gears so as to hit a bell when set time of the timer is up;

a connector connecting said valve to said timer;

a spring-loaded lift rod fitted into said connector, said spring-loaded lift rod having a hole in communication with two gas exits so that only when the lift rod is pressed downwards by said actuating arm will the hole of the lift rod be in communication with the valve.

4,690,171

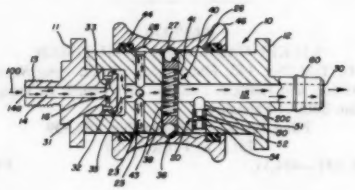
VALVE ASSEMBLY FOR A SPHYGMOMANOMETER

Charles F. Johnston, Rte. 1, Box 400, Fincastle, Va. 24090

Filed Jun. 5, 1986, Ser. No. 870,968

Int. Cl.[4] F16K *47/08*

U.S. Cl. 137—877 **10 Claims**



1. A valve assembly for a sphygmomanometer comprising:

(a) an inlet connectable to a fluid pressure source;

(b) an outlet connectable to a pressure cuff;

(c) inlet directional control means for preventing fluid flow from said pressure cuff to said inlet;

(d) metering means for metering the fluid flow from said pressure cuff at a fixed rate to control the deflation of said pressure cuff, said metering means having an orifice which provides a fixed flow throughout a metered deflation operation;

(e) quick vent means for rapidly deflating said pressure cuff; and

(f) a positively selectable valve selectively directing fluid flow from said inlet to said outlet through said inlet directional control means in a preset cuff inflation position, directing fluid flow from said outlet through said metering means in a preset metered deflation position during a metered deflation operation, or directing fluid flow from said outlet through said quick vent means in a preset quick vent position, said valve means including means for positively retaining said valve in a selected one of said cuff inflation position, said metered deflation position or said fast vent position.

4,690,172

FOLDABLE DUAL-SEAL NOZZLE DAM

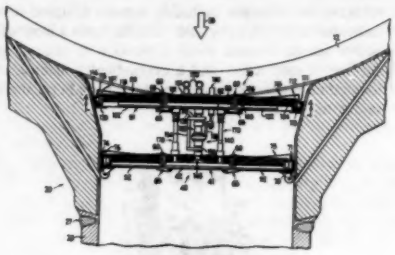
James W. Everett, New Stanton, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1985, Ser. No. 809,708

Int. Cl.[4] F16L *55/12*

U.S. Cl. 138—89 **10 Claims**

1. A nozzle dam for preventing fluid flow under pressure through a primary fluid nozzle in the plenum of a nuclear steam generating vessel, wherein the nozzle has an inner surface with a circularly cylindrical portion and a frustoconical portion, said nozzle dam comprising: first and second seal means each including a plurality of foldably interconnected sections, coupling means directly interconnecting one of said sections on said first seal means with a corresponding section on said second seal means independently of any other section, and support means only on said one section of one of said seal means disposed for supported engagement with the frustoconical portion of the inner surface of the nozzle for cooperation with said coupling means to support said first and second seal means in sealing conditions extending across and closing the nozzle, said seal means being responsive to pressurized fluid for urging said support means more firmly into supported engagement with the inner surface of the nozzle.



4,690,173

SHIRRED CASING ARTICLE

Algimantas P. Urbutis, Palos Heights, Ill., assignor to Viskase Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 436,057, Oct. 22, 1982, Pat. No. 4,578,842. This application Feb. 13, 1985, Ser. No. 701,309

Int. Cl.[4] A22C *11/00*

U.S. Cl. 138—118.1 **7 Claims**

1. A casing article comprising:

(a) a tubular core having a bore which is a size that is at least equivalent to the inside diameter of a stuffing horn selected from a range of stuffing horns used for filling a certain size of cellulosic casing; and

(b) a compressed casing stick on said core, said stick containing at least 200 feet of a moisturized, substantially pinhole-free, length of said certain size of cellulosic casing, shirred and longitudinally compacted to such a degree that said compressed casing stick embraces and exerts inward forces on said tubular core, said core being sufficiently rigid to resist said forces so as to maintain a bore diameter no less than the equivalent inside diameter of a said stuffing horn;

(c) said compressed casing stick having in substantially any one inch segment of stick length over substantially the full length of said stick a pack ratio of casing length to segment length of at least 100; and

(d) said pack ratio being substantially uniform over the length of said stick such that the variation of pack ratio along the length of said stick in successive one inch segments thereof is represented by a straight line as calculated by the least squares method, whose slope has an absolute value of less than about 0.500.

4,690,174

PLASTIC PIPE

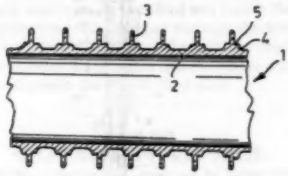
Jyri Järvenkylä , Tapiontie, Finland, assignor to Uponor N.V., St. Maarten, Netherlands Antilles

Filed Jul. 8, 1986, Ser. No. 883,543

Claims priority, application Finland, Jul. 30, 1985, 852947

Int. Cl.[4] F16L 9/04

U.S. Cl. 138—121 **10 Claims**



1. A plastic pipe comprising a tubular wall having an inner and an outer face, mutually spaced circumfential ribs having side walls protruding from said outer face and extending at substantially right angles with said wall and circumfential elevations protruding from said outer face of the wall and being integral with said pipe wall and said ribs, the elevations having an outer face joining both the side walls of the ribs, and the juncture between the side walls of said ribs and the outer face of said elevations being sharp.

4,690,175

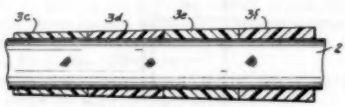
FLEXIBLE TUBE FOR ENDOSCOPE

Teruo Ouchi, Saitama, and Hiromichi Shibuya, Tokyo, both of Japan, assignors to Kabushiki Kaisha Medos Kenkyusho, Tokyo, Japan

Continuation-in-part of Ser. No. 512,376, Jul. 11, 1983, abandoned, which is a division of Ser. No. 441,998, Nov. 16, 1982, Pat. No. 4,495,134. This application Dec. 9, 1985, Ser. No. 806,379

Int. Cl.[4] A61B 1/06

U.S. Cl. 138—131 **3 Claims**



1. A flexible tube for use in an endoscope, comprising:

a flexible basic tubular core structure including an inner metallic tubular spiral having a series of turns spaced from each other by gaps and an outer surface constituted by an outer meshwork tube formed of a fabric mesh consituted by mesh elements, said outer meshwork tube being situated tightly over said inner metallic tubular spiral; and

at least two thermoplastic synthetic resin tube sections, each having a uniform inner diameter and a wall thickness which is thicker at one end of said tube section than at the other end thereof, said tube sections bonded to the meshwork of said meshwork tube, said synthetic resin tube sections having an inner diameter prior to being located over said tubular core structure which is less than an outer diameter of said basic tubular core structure, said bonding being accomplished by,

(a) expanding the inner diameters of said synthetic resin tube sections and locating the same over said meshwork tube of said tubular core structure with adjacent tube sections abutting at respective ends having substantially the same outer diameter;

(b) allowing said tube sections to contract so that said tube sections exert a compressive force on said core structure;

(c) heating said synthetic resin tube sections to a temperature at least slightly higher than a softening point and below a melting point of the synthetic resin of said tube so that the resin softens and enters into the meshwork tube under the compressive force;

(d) heating only the regions of said abutting ends of said resin tube sections substantially to a melting point of the tube sections to fuse the respective abutting ends to each other;

(e) cooling said synthetic resin tube sections so that the resin hardens and is integrally bonded to the meshwork of said meshwork tube while retaining an inherent compressive pre-stress in the flexible tube so formed;

said flexible tube so formed having a construction wherein:

(a) said synthetic resin tube sections have at least one of (1) portions which curve at least partially into spaces between said mesh elements of said outer meshwork tube, and (2) regions wherein said mesh elements are embedded therein, so that said resin tube sections are tightly bonded to said meshwork tube;

(b) said resin of said synthetic resin tube sections is totally absent from said gaps between said turns of said metallic tubular spiral; and

(c) said synthetic resin tube sections have an inherent compressive stress acting inwardly on said tubular core structure.

4,690,176

BACK REST ARRANGEMENT ON A WEAVING MACHINE

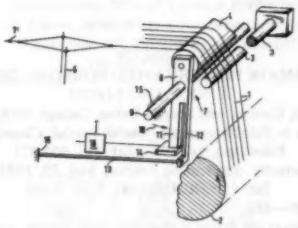
Theo Thalmann, St. Gallen, Switzerland, and Gerhard Oesterle, Koblach, Austria, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Feb. 10, 1986, Ser. No. 828,040

Claims priority, application Switzerland, Feb. 14, 1985, 668/85

Int. Cl.[4] D03C 49/06

U.S. Cl. 139—110 **7 Claims**



1. A back rest arrangement for a weaving machine having a back rest supported in positionally variable manner, comprising;

a machine frame for said weaving machine;

a support yoke possessing a first arm and a second arm and supported on said machine frame;

means cooperating with said machine frame for pivotably supporting said support yoke for pivotal motion about a pivot axis;

said back rest being supported on at least one of said first and second arms of said support yoke;

one of said arms of said support yoke possessing a resilient shank having a free end;

means for retaining said free end of said resilient shank in a manner which is relatively rigid in relation to a pivoting motion of the support yoke caused by a varying warp force acting on said back rest;

a sensor for generating an electrical signal proportional to a deflection of said resilient shank;

said sensor being operatively associated with said resilient shank;

said means for relatively rigidly retaining said free end of said resilient shank comprises a rod;

said rod has a free end; and

said free end of said rod being fixedly connected with said machine frame.

4,690,177

GRIPPER ROD FOR SHUTTLELESS LOOMS

Fritz Gehring, Lindau-Bodolz; Siegfried Roth, Salem-Mittelstenweiler, and Hans-Juergen Semrau, Kippenhausen, all of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau/Bodensee, Fed. Rep. of Germany

Filed Jun. 6, 1986, Ser. No. 871,510

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1985, 3527202

Int. Cl.[4] D03D *47/00*

U.S. Cl. 139—449 **7 Claims**

1. A gripper rod for a shuttleless loom, comprising a toothed rack section for cooperation with a pinion for driving said gripper rod, said gripper rod comprising a plurality of fiber reinforced belts of synthetic material laminated and bonded to one another to form a stack of said fiber reinforced belts, said belts further comprising perforations with dimensions increasing from belt to belt in an outward direction, and lands with correspondingly decreasing dimensions from belt to belt in said outward direction, said belts being arranged relative to each other so that said perforations are arranged in alignment relative to a central perforation axis extending perpendicularly to planes defined by said perforations in said belts so that teeth are formed by said lands between adjacent perforations for meshing with said pinion.

4,690,178

MOBILE HOOK FOR THE SHED FORMING DEVICE OF A WEAVING LOOM

Dario Bassi, Corbas, and Joseph Palau, Duingt, both of France, assignors to Establissements Staubli Verdol, Chassieu, France

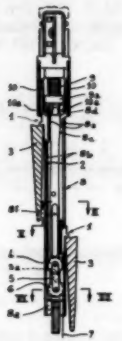
Filed Aug. 14, 1986, Ser. No. 896,272

Claims priority, application France, Aug. 23, 1985, 85 12817

Int. Cl.[4] D03C *13/00, 3/00, 3/06*

U.S. Cl. 139—455 **4 Claims**

1. In a weaving loom a shed forming device comprising a plurality of systems each having two mobile hooks movable between lower and upper positions by a movable knife means and connected by a funicular element, each of said mobile hooks having a toe portion which is selectively retained in said upper position by an elastic retaining blade which is movable in response to an electro-magnet, each of said systems being disposed between two vertically separating partitions assembled together to form an assembly, each of said partitions having opposing face portions including longitudinal grooves formed therein, each of said mobile hooks having a heel which is slideably and guidingly received within said grooves and between said separating portions, said mobile hooks also having a web which extends vertically between said partitions and which includes said toe portion and which also includes an outwardly extending nose element by which said hooks are driven by said knife means, and said hooks including a push element adjacent said toe portion which is engagable with said elastic retaining blade to urge said elastic retaining blade against said electromagnet jst prior to said hooks being at said upper positions whereby if said electromagnet is activated, said



elastic retaining blades will retain said hooks in said upper position.

4,690,179

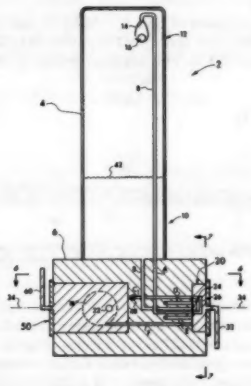
FLUID INDUCTOR AND METERING DEVICE AND METHOD OF USE

Joel J. Bleth, 928 9th East, and Williard R. Tormaschy, 819 8th Ave. West, both of Dickinson, N. Dak. 58601

Filed Nov. 19, 1986, Ser. No. 932,919

Int. Cl.[4] B65B *3/00*; F16K *31/02*

U.S. Cl. 141—1 **38 Claims**



1. A method for selectively using a primary flow of fluid through a conduit to first fill a chamber with a liquid from a remote storage container and then to empty the liquid from said chamber into said primary flow, said chamber having upper and lower portions and said method including the steps of:

(a) establishing said primary flow of fluid through said conduit from a first location to a second location,

(b) creating an area of reduced flow pressure in said primary flow at an intermediate location along said conduit between said first and second locations, said reduced flow pressure being less than ambient air pressure,

(c) providing a first flow path between said area of reduced flow pressure and the upper portion of said chamber,

(d) providing a second flow path from said remote storage container of liquid to the lower portion of said chamber,

(e) providing a third flow path between said area of reduced flow pressure and the lower portion of said chamber,

(f) providing a fourth flow path from air at ambient air pressure to the upper portion of said chamber, and

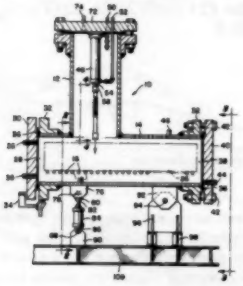
(g) selectively (1) opening the first and second flow paths and closing the third and fourth flow paths to reduce the pressure in the chamber below ambient air pressure to draw liquid from said remote storage container through the second flow path into the chamber through the lower portion thereof and then (2) closing the first and second flow paths and opening the third and fourth flow paths to draw liquid from the chamber through the lower portion thereof into the primary flow through the third flow path as air at ambient air pressure fills the upper portion of the chamber through the fourth flow path.

4,690,180

CYLINDER RUPTURE VESSEL

Jeffrey W. Gold, Atlanta, Ga., assignor to Integrated Environmental Services, Atlanta, Ga.

Filed Nov. 8, 1984, Ser. No. 669,537
Int. Cl.[4] B65B *31/00*; B67B *7/24*
U.S. Cl. 141—51 **21 Claims**



1. A waste cylinder rupture vessel, comprising:

an enclosed chamber with a longitudinal axis;

means for gaining access to the interior of said chamber;

bearing means located within said chamber adapted to support thereon a target container to be ruptured;

means for sealing said chamber;

means for communicating with the interior of said chamber to purge the air from said chamber;

means for communicating with the interior of said chamber to introduce an inert gas into said chamber; and

puncture means including moveable parts which are disposed entirely within said chamber for puncturing at least one wall of said target container, said puncture means being positioned along said longitudinal axis of the chamber at the mid section of the chamber, said puncture means being adapted to puncture the mid-section of said target container whereby the contents of said target container are released, said contents being contained within said enclosed chamber.

4,690,181

APPARATUS TO TRANSFER FLUID BETWEEN A FIXED STRUCTURE AND A ROTATABLE STRUCTURE BY USING AT LEAST ONE FLEXIBLE CONDUIT

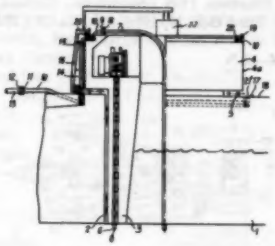
Pierre Carrio, Paris, France, assignor to Coflexip, Paris, France

Filed Nov. 12, 1985, Ser. No. 796,786
Claims priority, application France, Nov. 12, 1984, 84 17207
Int. Cl.[4] B63B *5/00*; E21B *43/01*
U.S. Cl. 141—388 **24 Claims**

1. Apparatus providing a swivelless connection of first and second fixed positions on respective first and second structures, which structures are relatively rotatable about a common axis, through a length of flexible conduit defined by first and second spaced portions thereof respectively connected to the first and second fixed positions and predetermined in accordance with the extent of relative rotation to be accomodated while continuously maintaining the connection, comprising:

first conduit storing means on the first support structure, extending about the axis of rotation in a generally arcuate configuration, for storing thereon, in corresponding arcuate configuration, substantially all of the predetermined length of flexible conduit;

second conduit storing means on the second support structure, extending about the axis of rotation in a generally arcuate configuration and relatively displaced from said first conduit storing means, for storing, in corresponding arcuate configuration, substantially all of the predetermined length of flexible conduit; and



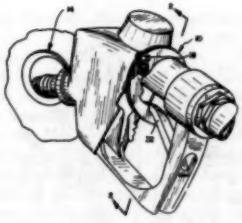
guide means defining a guide path extending between said first and second conduit storing means, said guide means being rotatable about the axis of rotation during relative rotation of the first and second structures for engaging a portion of the predetermined length of flexible conduit intermediate the first and second spaced portions thereof and guiding same out of one and into the other of said conduit storing means.

4,690,182

GASOLINE PUMP LEVER HOLDER

Raymond D. Knaus, 5565 Wilson Dr., Mentor, Ohio 44060

Filed Mar. 25, 1986, Ser. No. 843,497
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—392 **7 Claims**



1. An appliance in combination with a nozzle assembly such as is used to dispense gasoline or other fluids, wherein said nozzle assemply comprises an end portion from which the dispensed fluid emerges, a variable flow rate valve, an actuating lever that operates the valve, the position of which lever effects said variable flow rate, and a handle portion, and wherein said appliance comprises an open frame including a hook portion and an opposing and interconnected stepped portion having two or more steps, which hook portion releasibly and rotatably engages said handle portion of said nozzle

assembly by partially surrounding it in hook-like fashion, and said stepped portion having two or more steps, any one of which steps may be selected by the user by rotating the appliance about an axis that is substantially parallel with that of said handle portion of said nozzle assembly, thereby to releasibly engage the actuating lever on a selected step of said stepped portion for the purpose of positioning said lever and holding it unattended in a selected position to obtain a selected fluid dispensing rate from said nozzle assembly.

4,690,183

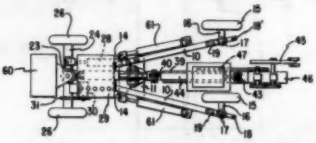
SELF-PROPELLED STUMP CUTTER

Donald M. Eilertson, 1109 Trinidad La., Garland, Tex. 75040

Filed Oct. 28, 1985, Ser. No. 791,734

Int. Cl.[4] A01G *23/06*

U.S. Cl. 144—2 N **16 Claims**



1. A self-propelled stump cutter comprising a frame, wheels on said frame adapted to carry the frame, motive means on said frame, drive means engaged between said motive means and at least one of said wheels whereby said wheel can be driven to propel said frame, steering means connected to at least one of said wheels whereby the stump cutter can be steered, cutting means movably mounted on said frame vertical and transverse movement relative to the frame, master motive means on said frame and drive means connected between said master motive means and said cutting means to cause said movement.

4,690,184

TREE PRUNING MACHINE

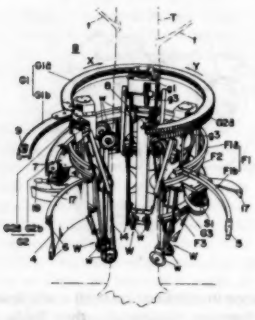
Tanitomi Fuminao, Houtaku, Japan, assignor to Kaisei Kogyo Corporation, Fukuoka, Japan

Filed Jan. 23, 1986, Ser. No. 821,642

Claims priority, application Japan, Apr. 27, 1985, 60-92119

Int. Cl.[4] B27L *1/00;* A01G *23/02*

U.S. Cl. 144—2 Z **2 Claims**



1. A tree pruning machine comprising:

a body;

a plurality of wheels connected to the body for elevating the body vertically on a tree;

a cutting unit connected to the body;

an engine;

means, connected to the engine and to the plurality of wheels, for driving the wheels with the engine;

means, connected to the engine and to the cutting unit, for driving the cutting unit with the engine;

wherein the cutting unit includes:

a first member connected to the cutting unit and extending generally vertically therefrom;

a drive wheel mounted on a lower portion of the first member, the drive wheel being connected to the cutting unit driving means;

a second member connected to the top of the first member, the second member extending in a forward direction and having an upward gradient for forming with the first member a recess therebetween; and

a saw chain engaging with the drive wheel and the second member.

4,690,185

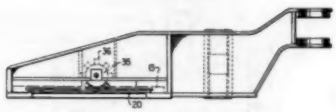
RIM DRIVEN ROTARY CUTTER AND TREE FELLING HEAD INCORPORATING THE SAME

Douglas D. Hamilton; Robert M. Palfy, and Hans Viereck, all of Montreal, Canada, assignors to Logging Development Corporation, Montreal, Canada

Filed Jan. 21, 1986, Ser. No. 820,053

Int. Cl.[4] A01G *23/08;* B27B *5/14*

U.S. Cl. 144—34 R **40 Claims**



1. A rim driven saw for cutting trees comprising a planar circular saw blade having combined gear and cutting teeth around the outer periphery thereof and a power driven pinion mounted on a supporting frame, said pinion having gear teeth meshing with said combined gear and cutting teeth of the saw, said saw and pinion being disposed in substantially the same plane, one face of each of said combined gear and cutting teeth on the saw being an active profile of a standard gear tooth mating with teeth on the drive pinion and in the other face having a cutting edge thereon each of said combined gear and cutting teeth having a profile of a conventional gear tooth that includes, relative to the direction of saw rotation, a top land portion, a leading and trailing face portion and a leading and trailing flank portion wherein the leading face portion is modified by a cut out which extends from a proximate a juncture of the leading face and flank portions to a leading edge of a cutter located at intersection of the said cut out portion and said top land.

4,690,186

LOG FEED APPARATUS

Robert E. Chapman, Surrey, Canada, assignor to Optimil Machinery, Inc., Delta, Canada

Filed Mar. 5, 1986, Ser. No. 836,308

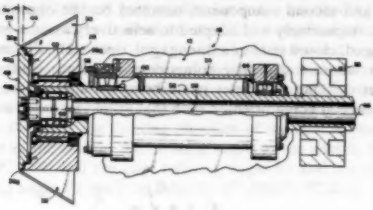
Int. Cl.[4] B02C *7/12;* B27C *1/08*

U.S. Cl. 144—176 **6 Claims**

1. In a chipper having means defining therethrough a linear transport path for a workpiece, and a rotary chipper head disposed adjacent such path including knife means which, with rotation of the head, defines a cutting plane including a circularly bounded cutting expanse,

means mounting such head for rotation in a manner whereby the knife means' cutting plane is disposed at an angle relative to the transport path, and

nonrotating workpiece guide means having a planar guide surface located within the boundary of the cutting ex-



panse, with the plane (guide plane) of said guide surface substantially paralleling the transport path.

4,690,187

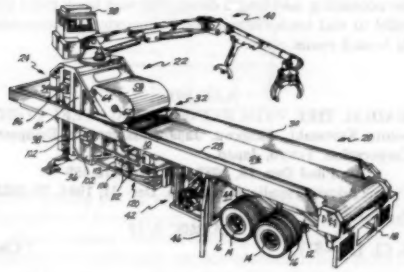
METHOD AND APPARATUS FOR FLAIL DEBARKING

Phillip A. Schmidt, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 678,437, Dec. 5, 1984, abandoned. This application Nov. 28, 1986, Ser. No. 935,595

Int. Cl.[4] B27L 3/00

U.S. Cl. 144—340 **13 Claims**



1. An apparatus for simultaneously debarking a plurality of logs of the type having infeed means for longitudinally conveying a plurality of logs in a side-by-side relationship along a substantially horizontal feed plane into a debarking station with flailing means and outfeed means for conveying the debarked logs away from the debarking station, comprising:

means located above and forming a part of the infeed means to help maintain the unbarked logs in their side-by-side relationship,

enclosure means substantially surrounding the debarking station including an infeed and an outfeed opening for the traveling logs,

at least one top and one bottom rotatable flail member, each spaced vertically from the feed plane, comprising the flailing means whereby as the logs travel through the debarking station the rotating flail members impact the logs knocking substantially all the bark thereform,

means within the enclosure means for collecting and directing the removed bark toward a debris outlet within the enclosure means and located below the feed plan, and

size reducing means located substantially at the debris outlet whereby collected bark is passed therethrough to be reduced in size before being directed to an external location.

7. A process for simultaneously debarking a plurality of logs of the type including longitudinally feeding a plurality of logs in a side-by-side relationship along a substantially horizontal feed plane into an infeed opening of a substantially enclosed debarking station having flailing means therein and after debarking conveying the debarked logs out of an outfeed opening and away from the debarking station, comprising the steps of:

exerting a force on the logs ahead of the flailing means to help maintain the unbarked logs in their side-by-side relationship,

rotating at least one top and one bottom flail member so the individual flail members will impact substantially all surface area of all logs thereby knocking substantially all the bark therefrom, and

collecting the removed bark within the enclosure for the flailing means and directing it to an outlet in the enclosure below the feed plane where a size reducing means is operable to reduce the bark in size before being directed to a location external to the enclosure.

4,690,188

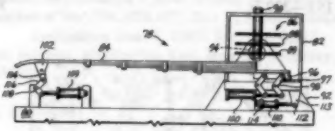
VARIABLE CURVE LINEBAR WITH SKEWABLE SAWS

Earl D. Hasenwinkle, Puyallup, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Oct. 27, 1986, Ser. No. 923,776

Int. Cl.[4] B27B 1/00, 25/02

U.S. Cl. 144—378 **21 Claims**



1. In combination, a linebar and saw assembly for sawing cants or logs having varying amounts of sweep from piece to piece which comprises:

at least one saw;

an elongated flexible linebar means conformable between a straight line and a line approximating an arc of a circle,

said linebar means being positioned relative to the saw so that one end is essentially adjacent to that centerline of the saw lying in the plane of the saw and normal to a projection of the longest dimension of the linebar,

both ends of the linebar means always lying on the line defined by said linebar means when in straight line position,

a tangent to the end of the linebar means adjacent the saw always being essentially parallel to the plane defined by saw saw;

said saw being skewable essentially about the point of intersection of the end of the linebar means adjacent the saw with a line drawn normal to the plane of the saw from said centerline;

bending means for controlling the curvature of the linebar; and

skewing means for the saw,

whereby said linebar means can be configured into an arc which approximates the sweep curvature of a cant or log being sawn and said saw can be skewed to maintain parallelism with the line of tangency of the linebar adjacent said saw so that a cant can be guided into the saw along a path approximating its radius of curvature.

17. A method of sawing cants or logs having varying amounts of sweep from piece to piece which comprises:

providing at least one saw;

further providing an elongated flexible linebar means conformable between a straight line and a line approximating an arc of a circle;

said linebar means being positioned relative to the saw so that one end is essentially adjacent to that centerline of the saw lying in the plane of the saw and normal to a projection of the longest dimension of the linebar,

both ends of the linebar means always lying on the line defined by said linebar means when in straight line position,

a tangent to the end of the linebar means adjacent the saw

always being essentially parallel to he plane defined by said saw;

said saw being skewable essentially about the point of intersection of the end of the linebar means adjacent the saw with a line drawn normal to the plane of the saw from said centerline;

bending the linebar to conform its curvature to the sweep curvature of the cant or log; and

skewing the saw to maintain parallelism with the line of tangency of the linebar adjacent said saw so that the cant is guided into the saw along a path approximating its radius of curvature.

4,690,189

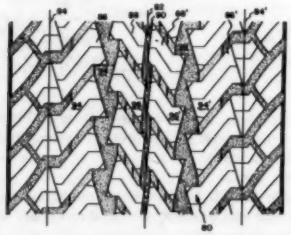
ALL-SEASON PNEUMATIC TIRE WITH CHAMFERED TREAD BLOCKS

John L. Bradisse, Munroe Falls, and Daniel J. Lindner, Canal Fulton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 29, 1986, Ser. No. 823,696

Int. Cl.[4] B60C *11/11*

U.S. Cl. 152—209 R **8 Claims**



1. An all-season radial-ply pneumatic tire for passenger and light-truck vehicles, the tire comprising:

(a) a radial carcass ply;

(b) a belt structure positioned radially outwardly of the carcass ply, the belt structure including at least one ply of cords, the belt structure having cords oriented at both positive and negative angles, in the magnitude range from 17° to 30°, with respect to the mid-circumferential plane of the tire; and

(c) a rubber tread positioned radially outwardly of the belt structure and having a surface adapted for use on paved road surfaces, the tread having grooves of width at the tread surface of at least 2 mm and the net-to-gross ratio of the tread being greater than 55%, such grooves defining blocks of rubber surrounded either fully by such grooves or by such grooves and the lateral edges of the tread road-contact surface, the rubber blocks being spaced apart circumferentially around the tread, intersecting walls of grooves that define the rubber blocks forming corners, circumferentially-spaced corners of the rubber blocks being chamfered toward the bottoms of the respective grooves that form such chamfered corners, thereby, to increase the stiffnesses of the rubber blocks.

4,690,190

SECURING DEVICE FOR A VEHICLE TIRE CHAIN

Ferdinand Jeindl, Graz, Austria, assignor to Steirische Kettenfabriken Pengg-Walenta KG, Graz, Austria

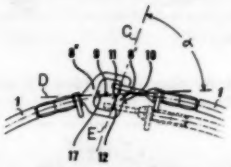
Filed Jan. 22, 1985, Ser. No. 693,684

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401972

Int. Cl.[4] B60C *27/06*

U.S. Cl. 152—213 A **7 Claims**

1. In a tire chain adapted to be mounted on and readily removed from a vehicle tire including an inner support extending, in the mounted state of the chain, circumferentially along and in engagement with an inwardly oriented tire side; said inner support having a spring steel yoke including adjacent opposite free yoke ends and a hook lock having cooperating first and second components mounted on the opposite yoke ends, respectively and adapted to selectively assume an interengaged, closed state or a disengaged, open state; the improvement wherein said first component is a flat, quadrangular eyelet defining an eyelet plane being parallel to the eyelet flatness and being oriented such that in said mounted state the



eyelet lies flat against the side wall of the tire and said plane being oriented perpendicularly to a rotary axis of the vehicle tire and further wherein said second component is a flat hook having a hook flatness and a length dimension generally oriented in a direction toward the yoke end on which said quadrangular eyelet is mounted; said flat hook defining a hook plane containing said length dimension; said hook plane being parallel to said hook flatness and being oriented perpendicularly to said eyelet plane.

4,690,191

RADIAL TIRE WITH REINFORCING STEEL CORD

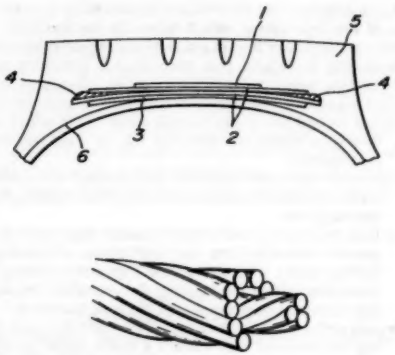
Kiyohito Kawasaki, Akigawa, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 18, 1985, Ser. No. 810,459

Claims priority, application Japan, Dec. 21, 1984, 59-268540; Jun. 18, 1985, 60-90826[U]

Int. Cl.[4] B60C *9/18*

U.S. Cl. 152—527 **7 Claims**



1. A radial tire having a combined reinforcement consisting of a belt composed of at least three piled cord layers with steel cords buried in parallel in rubber in which the cords in each of the layers are set at a relatively small angle with respect to a tire equatorial plane and the cords in at least one pair of the adjacent cord layers are intersectingly arranged at an angle from 15° to 30° and a carcass having cords arranged substantially at right angles with respect to the tire equatorial plane, wherein the steel cords buried in the at least one pair of the cord-intersecting cord layers other than the outermost cord

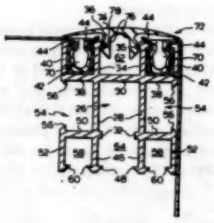
layer have Young's modulus of 6,000 to 16,000 kg/mm^2 and a flexural rigidity of 150 to 250 g, and the initial stage elongation (P.L.E.) of the rubberized cords taken out from the tire is not more than 0.2% and said cord being a tire reinforcing steel cord of a two layer twisted construction composed of a core consisting of from two to four steel filaments and a single sheath consisting of a plurality of the steel filaments surrounding the core wherein the steel filaments have a tensile strength of not lower than 260 kg/mm^2 and a filament diameter from 0.32 to 0.42 mm; the twisting direction of the core is reversed to that of the sheath; the twisting angle of the sheath, P2, is $72° \leqq P2 \leqq 80°$ and the core twisting angle P1 and the sheath twisting angle P2 meet the relation of $1.0 \leqq P1/P2 \leqq 1.1$.

4,690,192

REPLACEABLE AWNING

Johann Stilling, 1141 Royal York Road, Apt. A1001, Islington, Ontario, Canada

Filed Apr. 29, 1986, Ser. No. 857,158
Int. Cl.^{4} A47H *13/00*
U.S. Cl. 160—57 **6 Claims**



1. An awning having a modular frame and comprising;

a plurality of frame pieces, defining pairs of parallel longitudinal fastening channels defining a spacing therebetween;

an interior longitudinal junction channel formed along each said frame piece, said junction channel being located in a plane lying between said parallel fastening channels and offset to one side of said fastening channels;

an access opening defined by said junction; channel for access thereto from the exterior of said frame piece;

connecting means in said junction channels of adjacent said frame pieces connecting adjacent said frame pieces together in abutting relation;

adjustable locking means operable through said access opening from the exterior of said frame pieces;

flexible plastic panel means adapted to be stretched over said composite frame and fastened in said fastening channels, and,

elongated flexible wedging strips shaped and adapted to be force fitted into said recesses together with portions of said flexible panel means thereby wedging said portions of said flexible panel means in said channels and securing the same.

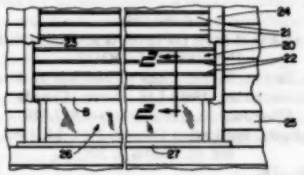
4,690,193

ROLLING SHUTTER CONSTRUCTION

Donald L. Morrison, Huntington Beach, and Stephen Bartok, Rancho Palos Verdes, both of Calif., assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 7, 1985, Ser. No. 763,453
Int. Cl.^{4} E06B *9/16*
U.S. Cl. 160—133 **23 Claims**

6. In a rolling shutter, a slat comprising a hollow slat body including at least one channel extending along the length thereof, and a pair of telescopically connected reinforcing members received in and extending substantially the length of



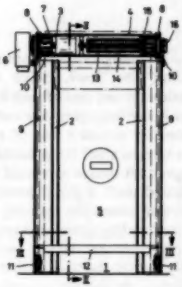
said channel, said reinforcing members being relatively movable telescopically for length adjustment.

4,690,194

DOOR WHICH CAN BE ROLLED UP

Kurt Seuster, Mühlenbach 9, 5990 Altena, Fed. Rep. of Germany

Continuation of Ser. No. 679,457, Dec. 7, 1984, abandoned. This application Jan. 8, 1987, Ser. No. 4,312
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345016
Int. Cl.^{4} A47G *5/02*
U.S. Cl. 160—265 **3 Claims**



1. A roll-up door means, in combination comprising:

a hanging door having a mass weight with a free end which can be rolled up as well as unwound and including a winding tube having two ends, one of said ends having a first inside-arranged spring receiving means mounted on a winding shaft for winding up and unwinding said hanging door for opening and closing-off an opening the other of said ends having a second inside-arranged spring receiving means connecting a pretensioned spring means relative to a fixed shaft for balance of the mass weight of said hanging door, said second spring receiving means being rotatably mounted on said fixed shaft being disposed between said second spring receiving means and said fixed shaft is said pretensioned spring means, a tensioning mechanism, being disposed between the free end of said hanging door and said winding tube, said winding tube also including therewith traction members which are guided about guide pulleys; said traction members being fixed with one end on said free end of said door and with the other end on said tensioning mechanism which comprises:

tensioning pulleys which are freely rotatably mounted at both ends of said winding tube; and

pretensioned leg springs respectively disposed between each of said tensioning pulleys and said winding tube;

said ends of said winding tube being axially recessed at each end thereof; and said leg springs being disposed in said axial recesses of said winding tube so that no additional

casing is required, said leg springs being subjected only to bending stresses particularly for long service life and no risk to safety.

4,690,195

APPARATUS FOR OPENING AND CLOSING INDUSTRIAL DOOR

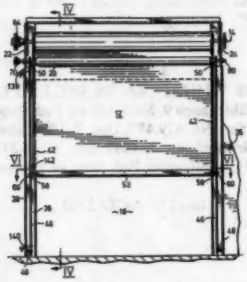
Douglas B. Taylor, Barrie, Canada, assignor to Cooper Cliff Door Manufacturing (1980) Ltd., Barrie, Canada

Filed Jun. 23, 1986, Ser. No. 877,520

Claims priority, application Canada, Nov. 14, 1985, 495376

Int. Cl.[4] E06B *9/204*

U.S. Cl. 160—310 **11 Claims**



1. An operator for a rolling door comprising a first shaft rotatable for actuating the door, drive sprocket means mounted for free rotation on one end of said first shaft, an idler roller, said idler roller in use engaging one surface of said door and extending horizontally across a top of an opening to be closed by said door, a second shaft for rotatably mounting said idler roller, second sprocket means mounted for free rotation on one end of said second shaft, a third sprocket for mounting on a drive shaft of power means for opening and closing said door, an endless chain extending about and engaging said drive sprocket means, second sprocket means and third sprocket, first dog means fixedly connected to said first shaft, said drive sprocket means including means for engaging said first dog means so that upon engagement said drive sprocket means can rotate said first shaft, second dog means fixedly connected to said second shaft, said second sprocket means including means for engaging said second dog means so that upon engagement said second sprocket means rotates said second shaft, endless chain loop means connectable to said door and provided for closing said door, and upper and lower sprocket means for guiding and moving said chain loop means, said lower sprocket means being adapted to be rotably mounted near the bottom of said opening and said upper sprocket means being mounted on said second shaft, wherein said door is opened by a driving connection extending from said third sprocket to said endless chain to said drive sprocket means and said door is closed by a driving connection extending from said third sprocket to said endless chain to said second sprocket means to said upper sprocket means and finally to said chain loop means.

4,690,196

CASTING OF MOLTEN FERROUS METAL AND MOULDS FOR USE THEREIN

Pierre Vernay, Milly la Foret, France, assignor to Foseco International Limited, Birmingham, England

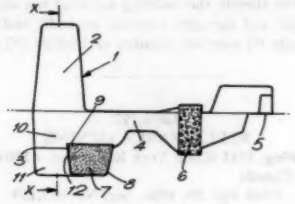
Filed Feb. 18, 1987, Ser. No. 16,005

Claims priority, application United Kingdom, Feb. 25, 1986, 8604569

Int. Cl.[4] B22D *27/00*

U.S. Cl. 164—58.1 **14 Claims**

1. A process for casting molten ferrous metal in a mould comprising providing a mould having a mould cavity and a runner system comprising a sprue, a sprue well and a runner, and having located in the runner a ceramic filter having an open-cell foam structure, locating in a chamber in the runner system on that side of the filter which is further from the mould cavity a sealed plastics container containing particles of a treatment agent for the molten ferrous metal such that part of the container is in the sprue well, and pouring the molten ferrous metal into the mould so that the molten ferrous metal is



treated by the treatment agent before flowing through the filter and into the mould cavity.

14. A mould for casting ferrous metal comprising a mould cavity and a runner system comprising a sprue, a sprue well and a runner, said mould having located in the runner a ceramic filter having an open-cell structure, and located in a chamber in the runner system on that side of the filter which is further from the mould cavity a sealed plastics container containing particles of a treatment agent for the molten ferrous metal such that part of the container is in the sprue well.

4,690,197

MOLTEN METAL POURING DEVICE

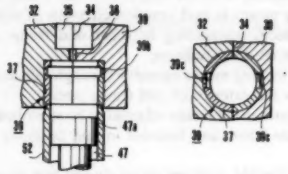
Sadayuki Dannoura, Ube, Japan, assignor to UBE Industries, Inc., Ube, Japan

Filed May 21, 1985, Ser. No. 736,654

Claims priority, application Japan, May 23, 1984, 59-102701; Dec. 19, 1984, 59-266232

Int. Cl.[4] B22D *17/12*

U.S. Cl. 164—312 **10 Claims**



4. In a die casting apparatus of the type having a stationary cover die and a rejector die which is movabe in horizontal direction to be joined with and separated from said cover die, said cover and rejector dies, when joined with each other securely, defining a die cavity having a small hole at a bottom thereof, a molten metal being injected into said die cavity from said hole to form a product, a vertical neck portion having a reduced diameter and an upper end communicated with said hole of the die cavity, and an enlarged-diameter vertical bore having an upper end communicated with a lower end of said neck portion and a lower end opened at the bottom surface of said cover and rejector dies; a vertical sleeve for containing said molten metal, an upper end of said vertical sleeve being adapted to the opened lower end of said vertical bore; and a plunger capable of vertically reciprocating in a bore of said

vertical sleeve and said vertical bore to force the molten metal into said die cavity through said neck portion;

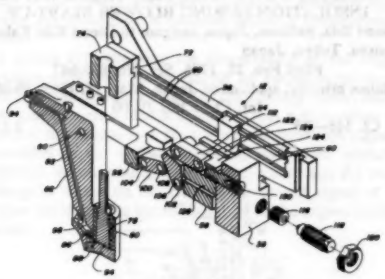
the improvement in said die casting apparatus comprising; a stationary sleeve which is split into halves along the parting surfaces of said cover and rejector dies and has an inner peripheral surface forming said vertical bore, an inner diameter of said stationary sleeve being substantially same as that of said vertical sleeve so that said plunger can pass upwardly through the bottom surface of said cover and rejector die without a reduction of a forcing pressure applied on said molten metal, a stepped portion being formed in the inner peripheral surface of said stationary sleeve.

4,690,198

INJECTOR FOR INJECTING MOLTEN MATERIAL INTO A DIE

Donald H. Hardey, and Franklin D. Austin, both of Rockford, Ill., assignors to Castech Enterprises, Inc., Rockford, Ill.

Filed Sep. 27, 1985, Ser. No. 780,810
Int. Cl.[4] B22D *17/04*
U.S. Cl. 164—316 **9 Claims**



1. In an injector of the piston type for a die casting machine including a gooseneck with a cylinder well adjacent its lower end, said cylinder well connected at its outlet by a delivery tube to a nozzle adjacent the upper end of the gooseneck for injecting molten material into the gate of a die, an inlet communicating the cylinder well with molten material in which the lower end of the gooseneck is dipped and a plunger which is reciprocated in the cylinder well, the improvement wherein the gooseneck is mounted on a slide between a pair of side mounts joined at one end by a block forming a rigid support and a toggle linkage against which the slide is held under compressive force by the toggle linkage and wherein a means for compensating for thermal expansion which maintains a substantially constant compressive force on the nozzle in the gate of the die is provided between the toggle linkage and the block.

4,690,199

APPARATUS FOR THE ROTARY SUPPLY OF MOLTEN CAST-IRON TO AN INSTALLATION FOR THE VERTICAL CONTINUOUS CASTING OF A PIPE FROM SPHEROIDAL GRAPHITE CAST-IRON

Yves Gourmel, and Michel Pierrel, both of Pont-A-Mousson, France, assignors to Pont-a-Mousson S.A., Nancy, France

Filed Dec. 9, 1985, Ser. No. 806,318
Claims priority, application France, Dec. 7, 1984, 84 18862
Int. Cl.[4] B22D *11/00*
U.S. Cl. 164—421 **4 Claims**

1. An apparatus for the continuous vertical extraction casting of pipes from spheroidal graphite cast iron, comprising:

(a) a cylindrical reservoir crucible (11, 12) for molten cast iron,

(b) cooling means (13) surrounding an outer circumference of the crucible,

(c) means for supplying molten cast iron to the crucible, and

(d) means for slowly rotating a mass of molten cast iron (F) in the crucible to ensure a constant wall thickness of pipes vertically extracted from the crucible over their entire peripheries, said rotating means comprising:

(1) a central relief (34) upstanding from a base (12) of the crucible and coaxial therewith,

(2) a blind cavity (35) defined within the relief,

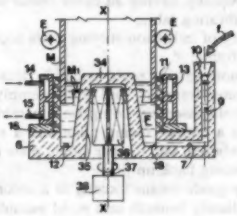
(3) a vertically oriented shaft (37) extending into the cavity from a lower end thereof,

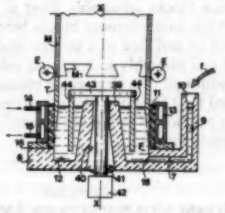
(4) magnet means (36) mounted to the shaft and disposed within the cavity, said magnet means extending vertically over substantially the entire height of the mass of molten cast iron in the crucible, and

(5) means (38) for slowly rotating the shaft and magnet means mounted thereto.

3. An apparatus for the continuous vertical extraction casting of pipes from spheroidal graphite cast iron, comprising:

(a) a cylindrical reservoir crucible (11, 12) for molten cast iron,





(b) cooling means (13) surrounding an outer circumference of the crucible,

(c) means for supplying molten cast iron to the crucible, and

(d) means for slowly rotating a mass of molten cast iron (F) in the crucible to ensure a constant wall thickness of pipes vertically extracted from the crucible over their entire peripheries, said rotating means comprising:

(1) a central relief (39) upstanding from a base (12) of the crucible and coaxial therewith, and extending upwardly to a height greater than the level of molten cast iron in the crucible,

(2) an axial bore (40) extending through the relief,

(3) a verticaly oriented shaft (41) extending through the bore,

(4) a horizontal member (43) extending radially outwardly from an upper end of the shaft, above a top of the relief,

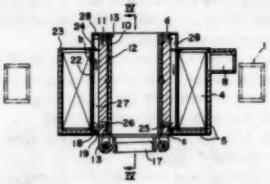
(5) a plurality of graphite bars (44) extending vertically downwardly from opposite outer ends of the horizontal member into the molten cast iron to a depth proximate the crucible base, and

(6) means (42) for slowly rotating the shaft and graphite bars mounted thereto.

4,690,200
INDUCTION STIRRER/CONTINUOUS CASTING MOLD ASSEMBLY

Hiroshi Okamoto, Nishinomiya, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 30, 1985, Ser. No. 696,531
Claims priority, application Japan, Feb. 16, 1984, 59-21467[U]
Int. Cl.[4] B22D 27/02, 11/124, 11/04
U.S. Cl. 164—504 5 Claims



1. An induction stirrer/mold assembly for use on a continuous casting machine, comprising:

a vibrating table;

a coil assembly having an outer frame securely fastened to said vibrating table;

a plurality of induction stirring coils accommodated in said outer frame;

a continuous casting mold assembly detachably mounted on said outer frame of said coil assembly, wherein sides of said mold assembly comprise separable mold walls each having a copper facing plate and a reinforcing back-up plate wherein said copper facing plate is connected to said reinforcing back-up plate;

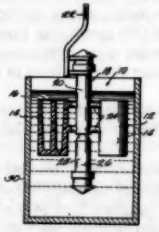
cast strip guide means located in a secondary cooling zone immediately beneath said mold assembly; and

mold aligning means for adjusting the position of said mold on said frame which comprise at least first and second reference blocks adjustably fixed at a lower end of said mold walls, said reference blocks being abuttingly engagable with an end face of a bottom wall of said outer frame of said coil assembly to hold said mold assembly in alignment with said cast strip guide means and a shim member attached to at least one of said reference blocks for adjusting the position of said mold assembly relative to said cast strip guide means.

4,690,201
LOST FOAM MOLD PATTERN AND ASSOCIATED METHOD

Russell J. VanRens, West Allis, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 21, 1985, Ser. No. 747,262
Int. Cl.[4] B22C 7/02, 9/04
U.S. Cl. 164—516 10 Claims



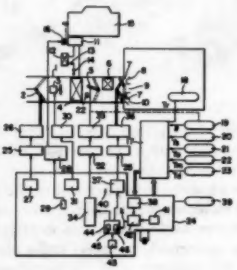
1. A foam mold pattern assembly comprising a pattern having opposite first and second ends and including a blind pocket open in one direction, first means connected to said pattern for facilitating suspension of said foam mold pattern assembly with said first end facing generally upwardly, second means for facilitating suspension of said foam mold pattern assembly with said second end facing generally upwardly, and means connecting said second means to one of said first means and said pattern for facilitating separation of said second means from said one of first means and said pattern.

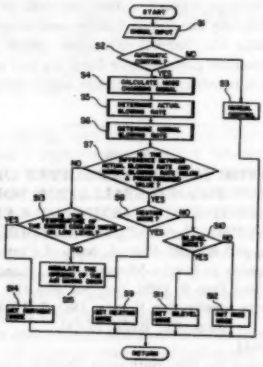
10. A method for preparing a foam mold pattern for casting in a lost foam casting process, said method comprising the steps of providing a foam mold pattern assembly including a pattern, a first projection connected to said pattern and extending therefrom in one direction, and a second projection connected to said pattern and extending therefrom in a direction generally opposite said one direction, providing a container of refractory coating, dipping said foam mold pattern assembly into said container of refractory coating with said first projection extending upwardly, drying said foam mold pattern assembly by suspending said foam mold pattern assembly by said second projection, and removing said second projection from said pattern.

4,690,203
AUTOMOTIVE AIR-CONDITIONING SYSTEM ADAPTED TO OBVIATE THE INFLUENCE OF INSOLATION DURING BLOWER START-UP

Katsumi Iida, Saitama, Japan, assignor to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 833,647
Claims priority, application Japan, Mar. 18, 1985, 60-053981
Int. Cl.[4] F25B 29/00
U.S. Cl. 165—25 2 Claims





1. An automotive air-conditioning system comprising:

(a) a combined signal producing means which calculates

combined signals T at least on the basis of room temperature, fresh air temperature, set temperature and intensity of insolation; a blower control means which controls a blower so that conditioned air is blown at a normal blowing rate corresponding to the combined signals T;

(b) an air mixing door control means which controls the opening of an air mixing door according to the combined signals T;

(c) a mode changing means which, according to a mode changing signal based on the opening of the air mixing door and on the temperature of an evaporator, establishes one of a defrosting mode where conditioned air is blown through a window defrosting opening, a face mode where conditioned air is blown through a center opening, a foot mode where conditioned air is blown through a foot opening, and a bilevel mode where conditioned air is blown through both the center opening and the foot opening;

(d) a blowing rate control means which increases the blowing rate of the blower gradually after the blower has been started;

(e) an arithmetic means which calculates the difference between the normal blowing rate corresponding to the combined signals T and the blowing rate during the initial stage of air-conditioning operation immediately after the start of the blower, and which provides a detection signal when the difference is reduced below a predetermined value;

(f) a sensor for detecting the temperature of the engine cooling water and for producing an output signal representative of the temperature of the cooling water; and

(g) a control means which operates from a time when the blower is actuated to a time when the detection signal is provided by the arithmetic means, and when operating controls the air mixing door control means and the mode changing means on the basis of the output signal of the sensor for detecting the temperature of the engine cooling water.

4,690,204

AIR INLET CHANNEL FOR A CHARGING AIR INTERCOOLER

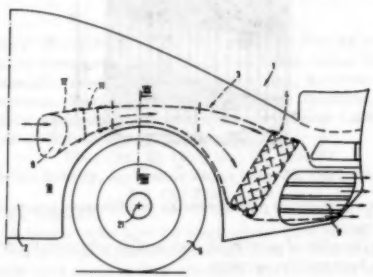
Anton Reichel, Ditzingen; Bernard Lohmann, Loeningen; Eugen Kolb, Stuttgart; Manfred Hochkönig, Moeglingen; Hermann Burst, Rutesheim, and Helmut Kretschmer, Waldaschaff, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 23, 1985, Ser. No. 779,044

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 8427918

Int. Cl.[4] B60K *13/02*

U.S. Cl. 165—44 **15 Claims**



1. An air supply channel for a charging air intercooler of an exhaust gas turbocharger of an internal combustion engine arranged within the rear of a vehicle having a body means, in which the air channel is arranged within a fender area of the vehicle and comprises air inlet and discharge opening means, the air channel being formed as a separate tubular structural element which is retained in a wheel casing of the body means above the rear wheel, said channel being connected at its inlet side with an inlet connection means fixed at the body means by way of a connecting sleeve means and at its air discharge side with the charging air intercooler.

4,690,205

ARRANGEMENT FOR ENSURING THAT ICE WILL FORM SUBSTANTIALLY UNIFORMLY ON A TUBULAR HEAT EXCHANGER PLACED IN WATER

Hans Jelbring, Fridhem 1, S-179 00 Stenhamra, Sweden

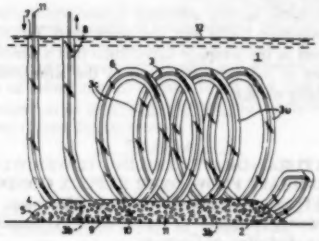
PCT No. PCT/SE84/00275, § 371 Date Apr. 12, 1985, § 102(e) Date Apr. 12, 1985, PCT Pub. No. WO85/00878, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 13, 1984, Ser. No. 723,962

Claims priority, application Sweden, Aug. 12, 1983, 8304381

Int. Cl.[4] F25C *1/12*

U.S. Cl. 165—45 **5 Claims**



1. An arrangement for ensuring that ice will form substantially uniformly on the outer surface of a tubular heat exchanger which is submersed to the bottom of a body of water and which comprises at least one tubular member, within which there flows a liquid heat carrier whose inlet temperature is lower than the freezing point of the water in said body of water, wherein the tubular member is so arranged that parts thereof contact said bottom at a plurality of locations so chosen that the distance between two mutually adjacent locations is short in relation to the length of tube between two consecutive contact locations between the tubular member and said bottom, and wherein parts of the tubular member located between said locations lie freely placed in said body of water, at least the majority of said parts in contact with the bottom of said body of water being covered with a suitably coherent layer of lump ballast material, which, due to the relatively low input temperature of the heat carrier flowing through said tubular member is caused to freeze to form a block of ice and ballast material, said frozen block therewith forming a heat conductor for distributing cold from the inlet of the tubular member and the areas adjacent thereto to remaining regions of said tubular member, so that there is formed an ice-coating of substantially uniform thickness on those parts of the tubular member which lie freely placed in said body of water between said locations.

4,690,206

NUCLEAR STEAM GENERATOR WRAPPER BARREL/TUBE SUPPORT PLATE CONNECTION ASSEMBLY AND RADIAL TUNING METHOD FOR ASSEMBLING SAME

Jeffrey D. Bein, Pleasant Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

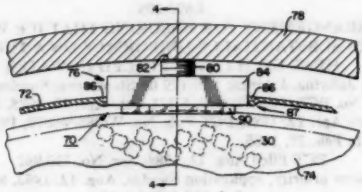
Filed Jul. 22, 1985, Ser. No. 757,719

Int. Cl.[4] F28F *7/00*

U.S. Cl. 165—81 **24 Claims**

13. A steam generator wrapper barrel/tube support plate connection assembly, comprising:

(a) a generally cylindrical outer shell having a first diameter;
(b) a wrapper barrel having a second, relatively smaller diameter so as to fit within the outer shell with an annular space therebetween, and being made of a material having a first coefficient of thermal expansion;
(c) a plurality of vertically spaced tube support plates located within the wrapper barrel, each being made of a



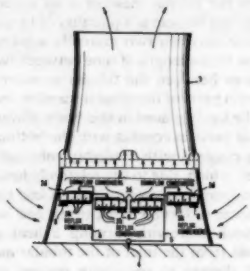
material having a second, relatively higher coefficient of thermal expansion; and
(d) adjustable jacking assembly means positioned between the wrapper barrel and the outer shell, for effecting a preload in the wrapper barrel such that a deformation is caused in the wrapper barrel at the adjustable jacking assembly means.

4,690,207

NATURAL-DRAFT COOLING TOWER WITH FORCED-DRAFT FLOW OVER REFLUX CONDENSERS

Burkhard Trage, and Richard Leitz, both of Ratingen, Fed. Rep. of Germany, assignors to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Nov. 5, 1985, Ser. No. 795,472
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1984, 3441514
Int. Cl.[4] F28B *1/06, 7/00*
U.S. Cl. 165—113 **2 Claims**



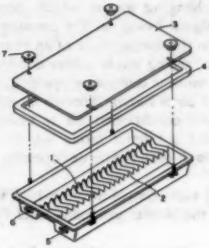
1. In a natural-draft cooling tower having a plurality of preferably roof-shaped heat exchange elements substantially standing rather than lying as arranged for direct heat exchange and for condensing the turbine exhaust steam from a power plant, wherein a portion of said heat exchange elements are connected to operate as condensers, and additionally another portion of said heat exchange elements are connected to operate as reflux condensers, with the latter being disposed downstream, when viewed in the direction of flow of said steam, of said heat exchange elements that are connected to operate as condensers;
the improvement wherein only each of said heat exchange elements that is connected to operate as a reflux condenser is provided with a respective fan installed internally therewith.

4,690,208

CONTAMINATED FLUID HEAT EXCHANGING

Brent D. Deck, 24 Shawmut Ter., Framingham, Mass. 01701

Filed Feb. 3, 1986, Ser. No. 825,535
Int. Cl.[4] F28F *13/12*
U.S. Cl. 165—119 **15 Claims**



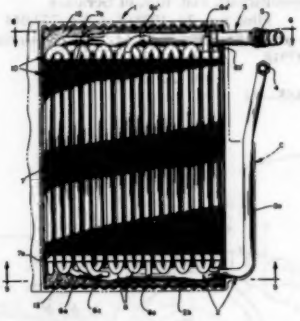
1. Mechanical filtering apparatus comprising,
means defining a fluid inlet,
fluid inlet means for receiving fluid,
fluid outlet means for expelling fluid,
a plurality of passage means intercoupling in parallel said fluid inlet means and said fluid outlet means for carrying fluid, string, lint and small substantially spherical solids from said fluid inlet means to said fluid outlet means while blocking the transfer of long thin objects,
each of said passage means being formed with an angular elbow which allows passage of fluid, string, lint and small substantially spherical solids therethrough but prevents the passage of said long thin objects.

4,690,209

AIR CONDITIONER EVAPORATOR SYSTEM

Cory I. Martin, 401 Second Ave., P.O. Box 26087, Dallas, Tex. 75226

Filed Mar. 18, 1985, Ser. No. 712,622
Int. Cl.[4] F28D *1/00*
U.S. Cl. 165—150 **6 Claims**



1. An evaporator package for air conditioners, comprising in combination:
a. a plurality of parallel air cooling fins substantially defining a heat transfer window,
b. a tube system having a plurality of tubes that are parallel within said window and wherein certain, but not all, of said parallel tubes above and below said window are connected at the ends of said package,
c. an intake manifold at one end of said package and connect-

ing to selected ones only of said tubes at that end of said package,

d. an exhaust manifold at the opposite end of said package and connecting to selected ones only of said tubes at that end of said package,

e. said tubes, fins and manifolds comprise an evaporator unit, and wherein

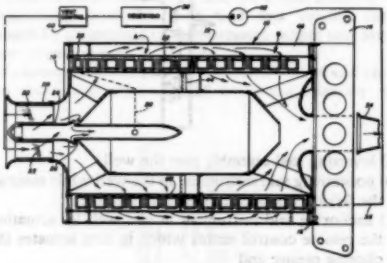
f. said manifolds and all said tubes connecting thereto being insulated at and near the joinder of said tubes and manifolds by an expandable foam material that simultaneously adheres to all of said tubes above and below said window, said manifolds and said package.

4,690,210

FLUID JET IMPINGEMENT HEAT EXCHANGER FOR OPERATION IN ZERO GRAVITY CONDITIONS

Richard Niggemann, and John Readman, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 1, 1985, Ser. No. 750,166
Int. Cl.[4] F28D *7/00*; F28F *9/22*
U.S. Cl. 165—159 **6 Claims**



1. A heat exchanger particularly suited for use in zero gravity conditions comprising

a spirally coiled tube;

a housing containing said tube;

an inlet to said housing centrally of said tube including swirl inducing means for imparting rotation to a fluid entering said housing;

an outlet from said housing opposite of said inlet;

a port centrally within said housing and just downstream of said swirl inducing means and in fluid communication with the interior of said tube through which lesser density components of an incoming fluid stream may pass to said tube interior; and

a baffle structure radially outwardly of said port and surrounding said tube for causing higher density components of an incoming fluid stream to impinge upon said tube before passing to said outlet.

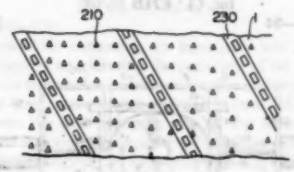
4,690,211

HEAT TRANSFER TUBE FOR SINGLE PHASE FLOW

Heikichi Kuwahara, Ibaraki; Kenji Takahashi, Abiko; Takehiko Yanagida, Tsuchiura; Wataru Nakayama, Kashiwa; Shigeo Sugimoto, Ibaraki, and Kiyoshi Oizumi, Tsuchiura, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 746,798
Claims priority, application Japan, Jun. 20, 1984, 59-125224
Int. Cl.[4] F28F *1/00*
U.S. Cl. 165—177 **6 Claims**

1. A heat transfer tube for single-phase flow having at least one row of projections formed on the inner surface of said heat transfer tube along at least one spiral curve, said at least one row of projections having a plurality of projections formed discontinuously, portions of the inner surface of the heat transfer tube between adjacent rows presenting surfaces parallel to the tube axis, each of said projections has a cross-section constituted by smooth curves at any portion along a height thereof including the bottom thereof, a cross-sectional area of said projections progressively decreases toward the top thereof, said projections have a height of 0.45 to 0.6 mm and are arranged at a circumferential pitch of 3.5 to 5 mm and an axial pitch of 5 to 15 mm, said heat transfer tube has porous heat transfer surfaces formed on the outer surface of said heat transfer tube, said porous heat transfer surfaces having a plurality of tunnel-shaped parallel cavities in outer surface portions



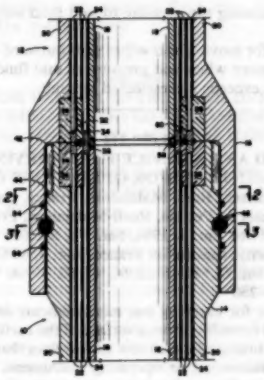
thereof, a plurality of openings formed in ceiling portions of said plurality of said tunnel-shaped cavities, a spiral groove is formed on an outer surface of the heat transfer tube and extends across said plurality of tunnel-shaped cavities, said spiral groove being formed when said projections are formed at the inner surface of the heat transfer tube, and wherein each of said plurality of tunnel shaped cavities opens in a direction of the spiral groove at an intersection of the spiral groove with the respective tunnel shaped cavities.

4,690,212

DRILLING PIPE FOR DOWNHOLE DRILL MOTOR

David E. Termohlen, 23 W. 4th St., Tulsa, Okla. 74103

Filed Feb. 25, 1982, Ser. No. 352,374
Int. Cl.[4] E21B *47/00, 17/042*
U.S. Cl. 166—65.1 **9 Claims**



1. A drilling pipe for maintaining electrical connection between the surface and a subsurface location comprising:

(a) a first fitting at one end of said pipe;

(b) a second fitting at the other end of said pipe adapted to connect with a fitting like that at the first end;

(c) a pipe sidewall interconnecting said end fittings and wherein said pipe sidewall substantially comprises a plurality of essentially parallel, tightly packed rods or wires cemented to each other wherein at least one of said rods or wires is electrically conductive and insulated from the rest of the pipe; and

(d) an alignment means for making electrical contact between corresponding insulated rods or wires when said

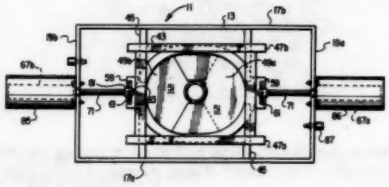
first fitting of one of said pipes is connected with said second fittinq of another of said pipes.

4,690,213

PNEUMATIC PIPE WIPER SYSTEM

James P. Stannard, Houston, Tex., and Charles W. Shockley, Lafayette, La., assignors to Pneumatic Pipewipers, Inc., Lafayette, La.

Filed Feb. 3, 1986, Ser. No. 825,338
Int. Cl.[4] E21B *33/08*
U.S. Cl. 166—84 **22 Claims**



19. A system for stripping fluid from the external surface of tubular articles being pulled from the wellhead of a well, said system being used in conjunction with a rig having a source for supplying fluid to said well, said system comprising:

a carriage mountable over said wellhead;

a pair of wiper pad assemblies slidingly mounted for inward and outward movement with respect to each other in said carriage;

actuator means for moving said wiper pad assemblies inward and outward with respect to each other in said carriage, said actuator means including an actuator having a cylinder and piston rod movable between a retracted position with respect to said cylinder and an extending position with respect to said cylinder;

pneumatic means for extending and retracting said piston rod;

means for sensing the pressure of said fluid supplied to said well;

and means for moving said wiper pads outward with respect to each other when said pressure of said fluid supplied to said well exceeds a preselected amount.

4,690,214

METHOD AND A DEVICE FOR CARRYING OUT MEASUREMENTS AND/OR OPERATIONS IN A WELL

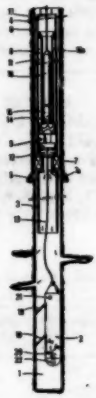
Christian Wittrisch, Rueil Malmaison, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 4, 1984, Ser. No. 596,604
Claims priority, application France, Apr. 7, 1983, 83 05823
Int. Cl.[4] E21B *23/00, 47/00, 49/00*
U.S. Cl. 166—250 **14 Claims**

1. A device for carrying out measurements and/or operations in a well extending from a surface of the earth, said device comprising a tubing of a diameter of less than that of the well, at least one measuring or operating instrument, at least one sealing member surrounding a lower portion of said tubing, a support member located above said instrument and supported by said tubing,

a flexible connecting member comprising at least one electrical connection, said flexible connecting member connecting said support member to said instrument, and means for causing the support member to move in said tubing between a first position and a second position corresponding respectively to one position in which said instrument is protected within the tubing and another position in which the instrument is partially out of said tubing; said tubing extending from the surface to a position within said well above a working position of said instrument.

11. A method for carrying out measurements or operations in a well extending from a surface of the earth, wherein an assembly is introduced into said well, said assembly comprising a tubing defining an annular space with a wall of said well, at least one measuring or operating instrument, a support member, a flexible connecting member connecting said member to said to said instrument, means for anchoring said instrument in said well and remote control means for actuating said anchoring means, said method comprising the following steps:



(a) lowering said assembly into the well;

(b) positioning said instrument in the well while maintaining the flexible connecting member stretched;

(c) anchoring said instrument in said well by actuating the the remote control means which in turn actuates the anchoring means; and

(d) relaxing said flexible connecting member.

4,690,215

ENHANCED CRUDE OIL RECOVERY

George W. Roberts; James G. Hansel, both of Emmaus, and Goutam H. Shahani, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 16, 1986, Ser. No. 864,179
Int. Cl.[4] E21B *43/243*
U.S. Cl. 166—261 **4 Claims**

1. In a process for secondary recovery of an oil field wherein waterflooding proceeds fireflooding, the improvement comprising terminating said waterflooding and initiating said fireflooding prior to achieving an oil in place value (OIP) of at least 0.1 and carrying out said fireflooding with an oxygen enriched atmosphere.

4. In a process for secondary recovery of an oil field wherein waterflooding to an oil in place value (OIP) of less than 0.1 preceeds fireflooding, the improvement comprising carrying out said fireflooding with an oxygen enriched atmosphere wherein the oxygen content is at least 90 volume percent oxygen.

4,690,216

FORMATION FLUID SAMPLER

John J. Pritchard, Jr., Harvey, La., assignor to Shell Offshore Inc., Houston, Tex.

Filed Jul. 29, 1986, Ser. No. 890,433
Int. Cl.[4] E21B *49/08*
U.S. Cl. 166—264 **11 Claims**

1. An apparatus for taking a sample of formation fluid when lowered into a well casing, said apparatus comprising:

sampling means having means for dividing the hollow interior thereof into a plurality of chambers axially displaced and adapted to be positioned along the longitudinal axis of said casing, each of said chambers having at least one port

through an outer wall thereof for allowing formation fluid to enter thereinto;

perforating means carried by said apparatus for perforating said casing wall;

first packing means operatively positioned below and adjacent said sampling means and being adapted to be sealingly set within said casing;

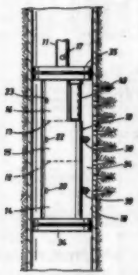
second packing means operatively positioned above and adjacent said sampling means and being adapted to be sealingly set to form a closed annular space between said sampling means and said casing and between said second packing means and said first packing means;

lowering means operatively connected to said sampling means for lowering said sampling means within said casing;

first valving means carried in the outer wall forming the lowermost chamber of said sampling means for normally closing each of said ports of said chambers;

second valving means carried by the means for dividing the hollow interior of said sampling means shared by said chamber above and adjacent said lowermost chamber and said lowermost chamber, said second valving means being in fluid communication with said lowermost chamber and sequentially actuatable with said first valving means caused by an increase in fluid pressure within said lowermost chamber; and

third valving means carried by the outer wall of said chamber above and adjacent said lowermost chamber, said



third valving means operatively engageable with said second valving means to open the port through the outer wall of the chamber above and adjacent said lowermost chamber to allow formation fluid to enter thereinto.

8. A method for taking a sample of formation fluid when lowered into a well casing, said method comprising:

lowering an apparatus having a sampling means including a plurality of chambers in fluid communication with each other and a perforating means operatively connected thereto into a well casing;

engaging first packing means operatively positioned below and adjacent said apparatus to be sealingly set within said casing;

engaging second packing means operatively positioned above and adjacent said apparatus to be sealingly set to form a closed annulus space between said sampling means and said casings and between said second and first packing means;

actuating said perforating means carried by said apparatus to perforate said casing wall;

opening first valving means carried by the outer wall of the lowermost chamber of said sampling means to allow formation fluid to enter thereinto;

then opening second valving means carried by means for dividing said sampling means into a chamber above and adjacent said lowermost chamber and said lowermost chamber caused by an increase in fluid pressure within said lowermost chamber; and

opening third valving means carried by the outer wall of said chamber above and adjacent said lowermost chamber, to allow formation fluid to enter thereinto.

4,690,217

PROCESS FOR WATER INJECTIVITY IMPROVEMENT TREATMENT OF WATER INJECTION WELLS

Davis L. Taggart, and Edward W. Heffern, both of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Aug. 15, 1986, Ser. No. 897,179
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 **11 Claims**

1. A method for enhancing the injectivity into an injection well and thereby accelerating the recovery of oil by a waterflood process from an oil-bearing subterranean formation penetrated by at least one injection well and at least one production well wherein the near wellbore area of the formation penetrated by the injection well has a low formation permeability to water as compared to the formation's absolute permeability, said method comprising:

injecting into the formation through an injection well, an aqueous fluid containing a first surface-active agent in an amount suitable to sweep the residual oil from the formation pore spaces in the near wellbore area and to thereby improve the water injectivity of said injection well, wherein the first surface-active agent has a general formula:

$$RO(C_3H_6O)_a(C_2H_4O)_bYX$$

where:

R is an alkyl group containing from about 3 to about 20 carbon atoms or an alkyl phenol, wherein the alkyl portion of the alkyl phenol contains from about 3 to about 20 carbon atoms or a mixture thereof;

a has an average value of from 0 to about 10;

b has an average value of from about 1 to about 10;

Y is a sulfate or sulfonate; and

X is a cation; and

thereafter injecting an aqueous fluid into the formation through the injection well.

4,690,218

METHOD FOR DEPTH CONTROL AND DETONATION OF TUBING CONVEYED GUN ASSEMBLY

Cyril R. Sumner, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 3, 1986, Ser. No. 848,008
Int. Cl.[4] E21B *43/116*
U.S. Cl. 166—297 **14 Claims**

1. A method of registering a tubing conveyed perforating assembly at a desired location in a well comprising the steps of:

(a) setting a packer in the well at some location above the approximate location of the desired formation;

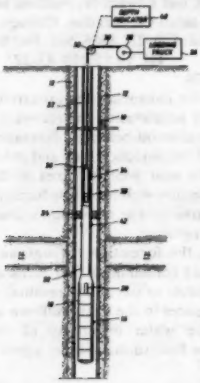
(b) lowering on a tubing string a tubing conveyed perforating assembly having a firing mechanism therewith, the lowering step extending the tubing string into the well until the tubing conveyed perforating assembly is below the approximate location of the desired formation;

(c) lowering a radioactive logging tool into the well on a logging cable;

(d) operating the logging tool along the well to locate the desired formation into which perforations are desired;

(e) raising or lowering the tubing conveyed perforating assembly on the tubing string to a position in the well registered with the formation wherein this step comprises: (1) initially installing a radioactive marker means in the tubing string prior to placing the tubing string in the well, (2) measuring the distance along the tubing string between the radioactive marker means and the tubing conveyed perforating assembly, (3) locating the radioactive marker means in the well through use of the radioactive logging tool, (4) then moving the tubing string in the well as a

function of the location of the radioactive marker means located in step (3), and (5) wherein the step of moving the tubing string is dependent on the measured distance between the radioactive marker means and the tubing conveyed perforating assembly and also on the location of the desired formation in the well determined in step (c);



(f) moving the logging cable to achieve an operative connection between the firing mechanism and the logging cable; and

(g) initiating operation of the firing mechanism through the logging cable to form perforations into the formation.

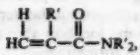
4,690,219

ACIDIZING USING N-VINYL LACTUM/UNSATURATED AMIDE COPOLYMERS

Lyle D. Burns, and G. Allan Stahl, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 586,504, Mar. 5, 1984, Pat. No. 4,578,201.
This application Dec. 5, 1985, Ser. No. 805,030
Int. Cl.[4] E21B *43/27*
U.S. Cl. 166—307 **29 Claims**

1. A process for acidizing a subterranean formation penetrated by at least one well comprising injecting into said formation, without a crosslinking agent, a water soluble thickened acid composition comprising: (1) water: (2) acid; and (3) a linear copolymer prepared from the monomers consisting of a N-vinyl lactam monomer and an alpha, beta-unsaturated amide monomer of the formula



where R' is methyl, ethyl or hydrogen, said copolymer being made in the absence of a crosslinking agent during polymerization of the monomers.

4,690,220

TUBULAR MEMBER ANCHORING ARRANGEMENT AND METHOD

Britt O. Braddick, Houston, Tex., assignor to Texas Iron Works, Inc., Houston, Tex.

Filed May 1, 1985, Ser. No. 729,231
Int. Cl.[4] E21B *23/06*
U.S. Cl. 166—382 **18 Claims**

5. A method of anchoring a member with anchor means thereon to a well bore tubular member by manipulating a setting string connected with a mandrel having housing means threadedly supported thereon and the member sealably connected therewith, the housing means having means to restrain relative movement between it and the mandrel to enable the mandrel to be manipulated for disconnecting from the housing means for relative longitudinal movement between the mandrel and housing means whereupon slip means supported on the housing means may be moved outwardly from a retracted position by slip actuating means to releasably secure the housing means to the tubular member which thereafter enables the setting string to be manipulated to anchor the member to the tubular member, release the mandrel from the anchored member while maintaining them engaged in a sealing relationship comprising the steps of:

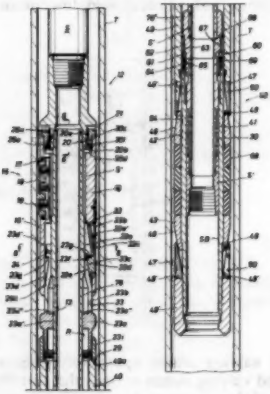
positioning the mandrel, housing means and member on the setting string;

lowering the setting string with the mandrel, housing means and member into the well bore;

rotating the setting string to threadedly disconnect the housing means from the mandrel;

maintaining the slip actuating means and slip means in contact while the slip means is in retracted position during lowering of the setting string in the well bore and while threadedly disconnecting the housing means from the mandrel;

manipulating the setting string to move the mandrel and slip actuating means to urge the slip means into engagement



with the tubular member to secure the housing means thereto;

manipulating the setting string to actuate the member anchor means and anchor the member to the tubular member; and

manipulating the setting string to release from the anchored member and remain in a sealing relationship therewith.

9. Apparatus to lower on a setting string and anchor in position in a well bore tubular member a member having tubular member engaging means to secure the member with the tubular member including:

a mandrel for securing with the setting string;

housing means;

means to releasably support said housing means on said mandrel, said mandrel being disconnectable from said housing means for securing said housing means with the tubular member by manipulating the setting string;

slip actuating means;

slip means;

surface means on said mandrel to maintain said slip means and slip actuating means in contact in retracted position as the apparatus is lowered in the well bore, said surface means and slip actuating means movable by said mandrel after said housing means is secured to the tubular member to urge said slip means outwardly from retracted position

to engage said slip means with the tubular member and secure said housing means thereto whereby said mandrel may then be manipulated to actuate the tubular member engaging means and anchor the member in the tubular member;

connecting means to release said mandrel from the anchored member; and

additional surface means on said mandrel positionable by the setting string to accommodate retraction of said slip actuating means and slip means to retracted position.

4,690,221

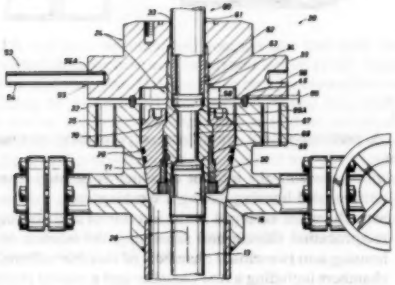
WELL TUBING HANGER METHOD AND APPARATUS FOR USE IN WELL CONTROL

Paul B. Ritter, Jr., Bakersfield, Calif., assignor to Shell California Production Inc., Houston, Tex.

Filed Jul. 3, 1986, Ser. No. 881,762

Int. Cl.[4] E21B *23/00, 33/04;* F16L *21/04*

U.S. Cl. 166—382 **23 Claims**



1. A well tubing hanger apparatus for use in well fluid control comprising;

a tubing head having a tubing head opening defined upwardly therethrough,

a moveable tubing hanger positioned within said tubing head opening, said moveable tubing hanger being moveable relative to said tubing head,

seal means located between said tubing head and said tubing hanger and being engageable in a fluid-tight manner therebetween, and

axial movement means operatively connected in a rotatable manner between said moveable tubing hanger and said tubing head to move, when rotated, said tubing hanger relative to said tubing head so as to engage said seal means in a fluid-tight manner between said tubing head and said moveable tubing hanger.

14. A method of well fluid control comprising the steps of: providing said well with;

a tubing head having a central longitudinal axis and a tubing head central opening defined upwardly therethrough,

a moveable tubing hanger centrally positioned within said tubing head central opening and having a tubing hanger central opening defined upwardly therethrough, said moveable tubing hanger being axially moveable relative to said tubing head along said central longitudinal axis,

seal means located between said tubing head and said tubing hanger and being engageable in a fluid-tight manner therebetween when said moveable tubing hanger is moved relative to said tubing head, and

axial movement means operatively connected in a rotatable manner between said moveable tubing hanger and said tubing head, being capable when rotated of axially moving said moveable tubing hanger relative to said tubing head along said central longitudinal axis,

rotating said axial movement means,

moving said moveable tubing hanger relative to said tubing head, and

engaging said seal means between said tubing head and said moveable tubing hanger in a fluid-tight manner, thereby preventing fluid flow between said tubing head and said tubing hanger.

4,690,222

HORSE SHOE

Kenneth A. Cameron, 8702 Meadow Rd., Downey, Calif. 90242

Filed Dec. 27, 1985, Ser. No. 813,946

Int. Cl.[4] A01L *5/00*

U.S. Cl. 168—4 **8 Claims**

1. A horse shoe comprising:

(a) a resilient curved body having

(1) an upper surface adapted to receive a horse's hoof;

(2) resilient tab means projecting upwardly and adapted to clampingly engage an outer surface of a horse's hoof and to position said horse shoe on said hoof;

(3) said upper surface of said horse shoe and the engaging surface of said tab means adapted to receive a bonding means, with at least said upper surface being provided with a plurality of openings for receiving said bonding means;

(b) a curved member embedded in said horse shoe comprising a material having a high strength to weight ratio, said openings being aligned with said curved member and passing through said upper surface terminating at an upper surface of said curved member; and,

(c) a lower surface provided with a plurality of downwardly depending projections, said lower surface further including a downwardly depending gripper portion having a portion of said curved member embedded therein.

4,690,223

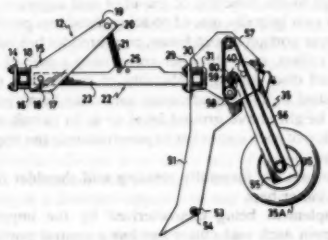
ROD WEEDER ATTACHMENT FOR AN AGRICULTURAL IMPLEMENT

Duane C. Haukaas, Box 202, Mortlach Saskatchewan, Canada (R=S0H 3E0)

Filed Jun. 11, 1986, Ser. No. 872,920

Int. Cl.[4] A01B *39/19*

U.S. Cl. 172—44 **20 Claims**



1. A tillage attachment device for mounting on an agricultural implement of the type comprising a tool bar, ground wheels for supporting the tool bar for movement across the ground and means for causing the tool bar to move in a direction transverse to its length, the device comprising clamp means for attachment of the device to the tool bar, rigid pivot

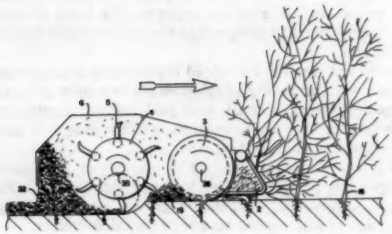
arm means mounted on said clamp means so as to extend rearwardly therefrom and so as to be pivotal about a horizontal axis at right angles to said arm means, spring biasing means connected between said clamp means and said pivot arm means for biasing said arm means downwardly around said axis, a ground engaging wheel mounted on said arm means remote from said clamp means for running on the ground rearwardly of and following said tool bar, said ground wheel being of a type such that its engagement with the ground controls the height of said arm means from the ground, strut means rigidly mounted upon and extending transversely to said arm means, two vertical ground engaging rigid shank means each rigidly mounted on said strut means at horizontally spaced locations and extending downwardly therefrom for engagement with the ground, a rod extending between said shank means at respective lower ends thereof, bearing means mounting said rod on each of said shank means for rotation relative thereto about a longitudinal axis of said rod and drive means for communicating drive from said ground wheel to said rod for rotating said rod.

4,690,224

AGRICULTURAL IMPLEMENT FOR DISPOSAL OF CROP RESIDUE

Mark Shwez, 3/13 Zahal Street, Haifa, Israel (35052)

Filed Dec. 23, 1985, Ser. No. 812,507
Int. Cl.[4] A01B *33/00*
U.S. Cl. 172—45 **2 Claims**



1. An agricultural implement for clearing a field of residue of plants growing in parallel rows and adapted to simultaneously clear at least two rows of plant stalks, comprising

a frame provided with means for its attachment to an agricultural traction vehicle adapted to move said implement across a field along said rows of plant stalks, said frame having a front end and a rear end,

at least two rollers rotatably fastened in the front portion of said frame on horizontal axle means positioned at right angles to the direction of travel of said implement,

at least two laterally spaced rotating shredders positioned in the rear portion of said frame, one shredder behind each of said rollers, each shredder comprising a pair of laterally spaced discs having a plurality of cutter bars pivotally attached to its circumference, said discs being positioned at a height above ground level so as to permit at least a portion of each cutter bar to penetrate into the upper layer of the soil,

drive means for forcefully rotating said shredder discs and said cutter bars,

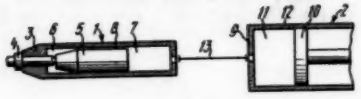
the implement being characterized by the improvement wherein each said cutter bar has a central portion positioned laterally between said discs and extends radially outwardly to a cutting edge beyond the circumference of said discs and has two side portions extending laterally beyond the sides of the discs spaced radially inwardly from the cutting edges, permitting said central portion to penetrate into the soil, and said side portions to rotate close to and above the ground level.

4,690,225

PERCUSSIVE TOOL

Konstantin K. Tupitsyn; Sergei K. Tupitsyn; Alexandr D. Kostylev; Veniamin V. Kamensky, and Sergei A. Chufistov, all of Novosibirsk, U.S.S.R., assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, Novosibirsk, U.S.S.R.

Continuation of Ser. No. 413,891, Sep. 1, 1982, abandoned. This application Sep. 20, 1985, Ser. No. 777,880
Claims priority, application U.S.S.R., May 14, 1979, 2765328
Int. Cl.[4] B25D *9/02*
U.S. Cl. 173—116 **8 Claims**



1. A percussive tool comprising a percussion mechanism having:

a hollow housing the interior of which is isolated from the outside, said housing having a working end;

a piston hammer arranged in the interior of said housing for reciprocation therein and separating the interior of said housing into two closed chambers of variable volume, said chambers including a first chamber and a second chamber, said first chamber communicating only with said second chamber, and said second chamber communicating with said first chamber and with a source of pressurized gaseous fluid;

a restrictor passage continuously freely intercommunicating said first and second chambers of said housing during the entire operation of the percussive tool; and

a pressure pulser having:

a housing;

a source of gaseous fluid;

a fluid displacer arranged inside said housing of said pressure pulser and defining with the walls of said housing a working chamber;

communicating means for communicating said working chamber with said source of gaseous fluid, said communicating means including an opening provided in the side surface of the housing of the pressure pulser to communicate said working chamber with the source of gaseous fluid and also to be closed by the side surface of the fluid displacer depending on the position of the fluid displacer relative to the housing of the pressure pulser;

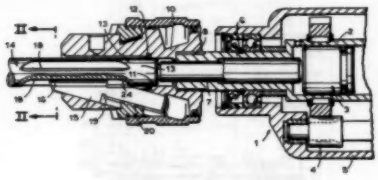
means for constantly communicating said working chamber with said second chamber of said percussion mechanism while said first chamber of said percussion mechanism remains closed except for the continuous free intercommunication between said first chamber and said second chamber provided by said restrictor passage; and

driving means for driving said fluid displacer inside said housing of said pressure pulser for periodically varying the volume of said working chamber to transmit to said second chamber of said percussion mechanism a pulsed pressure under action of which reciprocations of said piston hammer are effected to deliver impacts to said working end of said hollow housing.

4,690,226
HAMMER DRILL

Albrecht Schnizler; Manfred Schulz, both of Nürtingen, and Klaus Bartmann, Neuffen-Kappishäusern, all of, Fed. Rep. of Germany, assignors to Metabowerke GmbH & Co., Nürtingen, Fed. Rep. of Germany

Continuation of Ser. No. 645,846, Aug. 29, 1984, abandoned. This application May 12, 1986, Ser. No. 864,738
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1983, 3331866; European Pat. Off., Jul. 7, 1984, 84107973.4
Int. Cl.[4] B25D *17/08*
U.S. Cl. 173—128 6 Claims

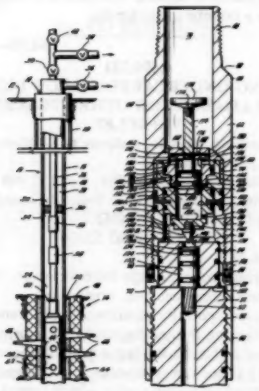


1. A tool for a hammer drill comprising a tool shaft having a profiled cross-section; and an adapter sleeve axially displaceable on said tool shaft and having an inner cross-section corresponding to said profiled cross-section of said tool shaft and also having a cylindrical outer surface, said outer cylindrical surface being fixedly clampable by clamping surfaces of clamping jaws, said profiled cross-section of said tool shaft having at least guiding grooves, said adapter sleeve having inwardly extending guiding surfaces cooperating with said guiding grooves, said tool shaft having two abutments, said adapter sleeve being arranged to be displaceable between said two abutments of said tool shaft.

4,690,227
GUN FIRING HEAD

Flint R. George, Katy, and Marlin R. Smith, Houston, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 481,069, Mar. 31, 1983, abandoned. This application May 28, 1985, Ser. No. 738,617
Int. Cl.[4] E21B *43/116*
U.S. Cl. 175—4.56 28 Claims

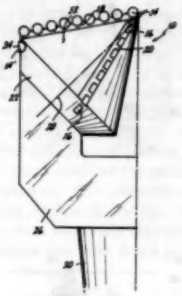


1. A well perforating gun firing head comprising:
an expansible chamber having a movable wall carrying a firing pin;
first valve means for admitting pressure fluid to the chamber;
second valve means for equalizing pressure on opposite sides of the movable wall;
said first and second valve means being interconnected whereby when the first valve means is closed the second valve means is open and vice versa;
primary frangible means holding the movable wall against movement;
ancillary frangible means holding the first valve means in closed position; and
release means for causing the sequential release of initially the ancillary frangible means and ultimately the primary frangible means.

4,690,228
CHANGEOVER BIT FOR EXTENDED LIFE, VARIED FORMATIONS AND STEADY WEAR

Dieter Voelz, Burgwedel, Fed. Rep. of Germany, and Roland Illerhaus, Salt Lake City, Utah, assignors to Eastman Christensen Company, Salt Lake City, Utah

Filed Mar. 14, 1986, Ser. No. 839,415
Int. Cl.[4] E21B *10/20, 10/62, 44/00*
U.S. Cl. 175—24 21 Claims



1. A drag bit in combination with a drill string arranged and configured to drill when rotated in a single predetermined direction comprising:
a bit body;
at least one carrier rotatably coupled to said bit body;
a plurality of cutting elements disposed on said carrier; and
means for selectively rotating said carrier to selectively dispose said cutting elements into an operative configuration without rotating said drill string in any direction other than said predetermined direction,
whereby cutting properties of said drag bit are selectively altered.

15. An improvement is a roller cone bit in combination with a drill string for cutting a rock formation said drill string arranged and configured to drill when rotated in a single predetermined direction, said roller cone bit comprising a plurality of roller cones, said improvement comprising:
a plurality of sets of drag cutters disposed on each one of said plurality of roller cones; and
means for selectively preventing rotation of each roller cone to present selected ones of said sets of drag cutters to said rock formation for cutting without rotating said drill string in a direction opposite to said predetermined direction,
whereby cutting performance of said roller cone bit as a drag bit is selectively alterable.

20. In a drill string adapted to drill in a single direction or rotation, a method for selectively presenting ones of a plurality of sets of drag cutters for cutting into a rock formation, said drag cutters disposed on roller cones of a roller cone bit, said roller cones being generally free to rotate with rotation of said roller cone bit, said method comprising the steps of:

rotating said roller cone bit; and

selectively preventing rotation of each roller cone of said bit to dispose selected sets of said plurality of drag cutters to said rock formation for cutting, without rotating said drill string in the direction opposite to said single direction.

4,690,229

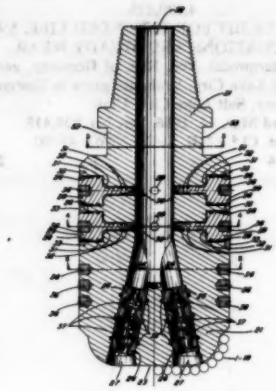
RADIALLY STABILIZED DRILL BIT

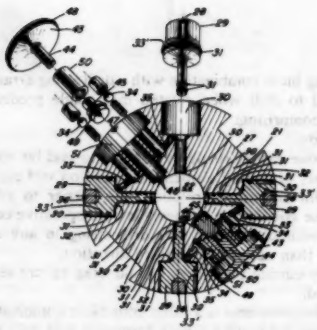
Richard C. Raney, 3609 Godfrey Ct., Midland, Tex. 79707

Filed Jan. 22, 1986, Ser. No. 820,742

Int. Cl.[4] E21B *10/60, 17/10*

U.S. Cl. 175—325 **18 Claims**





1. A stabilized drill bit comprising: a generally cylindrical main body having means at an upper end thereof for attachment to a driving means; a drilling face at the lower end of said main body; drilling cutters secured to said face; a throat formed through said main body for passage of drilling fluid to said face; flow restricting means positioned in the fluid path of the bit with said flow restricting means arranged to provide a fluid pressure drop therethrough; radially active stabilizing means for radially stabilizing said main body; means responsive to fluid pressure in said bit for applying outward force on said radially active stabilizing means and thereby moving said radially active stabilizing means into any one of a range of different extended positions; and blocking means for selectively preventing inward radial movement of said radially active stabilizing means from any of said extended positions upon application of radial force upon said main body opposed to said radially active stabilizing means sufficient to displace said fluid pressure in said bit.

4,690,230

MULTI-RANGE LOAD CELL WEIGHING INSTRUMENT

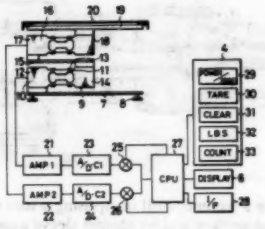
Mitsuo Uchimura, and Tsutomu Masuyama, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1986, Ser. No. 850,044

Claims priority, application Japan, Apr. 25, 1985, 60-89263

Int. Cl.[4] G01G *3/08, 3/14*

U.S. Cl. 177—229 **6 Claims**



1. A multi-range load cell weighing instrument comprising:

means for supporting an article to be weighed;

a low range load cell having a high accuracy weighing range and including means for outputting a first signal in response to a weight on said supporting means;

a high range load cell having a high load weighing range which is higher than said high accuracy weighing range, said high range load cell including means for outputting a second signal in response to a weight on said supporting means;

means for receiving said first and second signals and for outputting a weight signal as a function of one of said first and second signals, wherein said means for receiving includes means for outputting said weight signal as a function of said first signal for any said weight within said weighing range of said low range load cell, whereby high accuracy weighing is achieved;

means for counting a number of repetitions of receiving said first and second signals by said means for receiving; and

means for outputting a counting signal as a function of said received repetition signals, whereby said instrument may be used as a counting instrument.

4,690,231

TRACKLAYING UNDERCARRIAGE FOR BULLDOZER, CRAWLER LOADERS OR OTHER TRACKLAYING VEHICLES

Peter Riml, Mieming, Austria, assignor to Liebherr-Werk Telfs GES. m.b.H., Telfs, Austria

Filed Feb. 26, 1986, Ser. No. 832,999

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1985, 3506774; Feb. 3, 1986, 3603261

Int. Cl.[4] B62D *55/00*

U.S. Cl. 180—6.48 **5 Claims**

1. A tracklaying undercarriage for bulldozers, crawler loaders or other tracklaying vehicles, comprising:

(a) an elongated centrally positioned main frame;

(b) two tracklaying frames disposed on opposite sides of the main frame and both having a pair of spaced ends, said tracklaying frames each supported at one end on one of a pair of aligned supporting axles which extend transversely of and are fixed to the main frame and extend from the main frame to the respective tracklaying frame, said tracklaying frames supported at the other end on a rocker bridge that lies forward of the supporting axles, extends transversely of and is pivotally mounted at its center to the

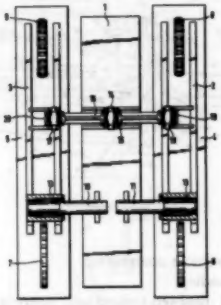
main frame on a pivot extending in the longitudinal direction of the main frame;

(c) driving and reversing chain sprockets mounted at mutually opposite ends of the tracklaying frames;

(d) track chains that pass around respective pairs of said driving and reversing chain sprockets;

(e) driviing means for driving the driving chain sprockets;

(f) two juxtaposed spherical bearings for carrying each tracklaying frame on its respective supporting axle, said bearings having outer races non-rotatably connected to



the tracklaying frames and inner races non-rotatably connected to the supporting axles, said outer and inner races interconnected by elastic material disposed therebetween; and

(g) said tracklaying frames being carried on the rocker bridge on elastic bearing means having outer races non-rotatably connected to the tracklaying frames and inner races non-rotatably connected to the rocker bridge, said outer and inner races interconnected by elastic material disposed therebetween.

4,690,232

HOLD DOWN APPARATUS FOR THE TIPPABLE STRUCTURE OF A VEHICLE

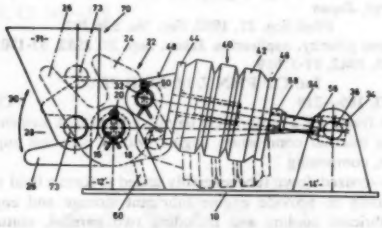
Gerd Schulz, Hamburg, Fed. Rep. of Germany, assignor to Gerd Schulz Fahrzeug- und Container-Technik, Hamburg, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 805,883

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444804

Int. Cl.[4] B62D *33/06*

U.S. Cl. 180—89.14 **11 Claims**



1. A hold down apparatus for a vehicle of the type having a vehicle body and a tippable structure pivotally mounted on said vehicle body, said tippable structure having a locking bolt thereon, and said hold down apparatus being adapted to cooperate with said locking bolt to hold said tippable structure in a desired position on said vehicle body, the improvement in said hold down apparatus comprising

a clamping catch mountable on said vehicle body, said clamping catch being pivotable about a transverse axis, said clamping catch having a fork-like member formed by a pair of spaced prongs lying on one side of said transverse axis, and

a spring device having an adjustable spring force, said spring device being pivotally connected to said clamping catch on the other side of said transverse axis, said spring device having a compression spring which is pivotally connectable to said vehicle body at that end of said spring device remote from said clamping catch, said clamping catch being pivotable about said transverse axis between a release position in which said fork-like member is positioned to face said tippable structure for receiving said locking bolt therein and a hold down position in which said locking bolt is captured within said fork-like member by prongs for preventing movement of said locking bolt, said spring device comprising

a hollow rubber compression spring captured between two mounting plates, said mounting plates having adjustable relative spacing therebetween,

a projection fixed to one side of one of said mounting plates, said projection being pivotally attached to said clamping catch,

a tubular projection fixed to the other side of said one of said mounting plates, said tubular projection extending within said hollow rubber spring,

a central hole defined in the other of said mounting plates,

a partially threaded rod that extends through said central hole, one end of said bolt being telescopically received within said tubular projection and the other end of said bolt being pivotally attachable to said vehicle body, and

a nut threaded on said rod, said nut bearing against an outer surface of said other mounting plate for forming an adjustable stop for said other plate, and

an over center connector that connects said spring device and said clamping catch such that said clamping catch has an over-centre action when said clamping catch is moved between said release and hold down positions.

4,690,233

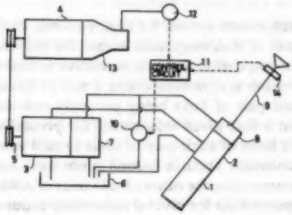
STEERING POWER CONTROL SYSTEM IN ELECTRONICALLY CONTROLLED STEERING SYSTEM

Toshihiko Daido, Osaka, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Dec. 9, 1985, Ser. No. 806,349

Int. Cl.[4] B62D *5/09*

U.S. Cl. 180—142 **4 Claims**



1. A power steering control device for use in an electronically controlled power steering system of a vehicle wherein the degree of opening of an orifice in a liquid pressure circuit is controlled by an actuator to adjust the steering force, the device comprising:

actuator driving means for driving the actuator to selectively open or close the orifice;

memory means for storing a plurality of orifice control data, each of said orifice control data corresponding to the effect on the level of steering force of a different combination of values of a set of external factors that affect the

level of steering force, said factors including the steering angle of the vehicle and the vehicle speed;

means for detecting the actual values of each of said external factors, said detecting means including a vehicle speed sensor and a steering angle sensor correcting means for sampling for a predetermined period of time the steering angle of the vehicle, for computing the average value of said sampled steering angle, and for outputting the absolute value of the difference between the steering angle and the computed average thereof; and

means responsive to said detected actual values including the vehicle speed and said absolute value for accessing from said memory means orifice control data corresponding to the combination of said detected actual values and supplying said accessed orifice control data to said actuator driving means to drive the actuator and correspondingly open or close the orifice to adjust the steering force in accordance with said detected actual values.

4,690,234

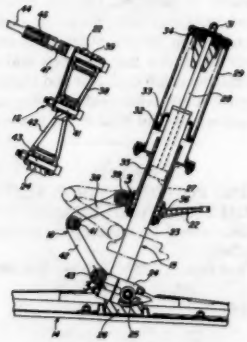
STABILIZING MEANS FOR SNOWMOBILE

Kazuyoshi Takada, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 11, 1986, Ser. No. 850,985

Int. Cl.[4] B62B *13/08, 17/04*

U.S. Cl. 180—182 **9 Claims**



1. In a suspension system for a snowmobile or the like comprising a pair of skis, suspension means for suspending each of said skis for suspension movement relative to said snowmobile, each suspension system comprising a pair of links, the links of each of said pair of links being pivotally connected to each other about a first pivot axis, means for pivotally connecting one of said links of each pair of links to said snowmobile for pivotal movement about a second pivot axis, and means for pivotally connecting the other of said links of each pair of links to the respective ski for pivotal movement about a third pivot axis, the improvement comprising a torsion bar extending between said suspension systems, fixing means fixing one end of said torsion bar for rotation, with one of said links of one of said pair of links about one pivot axis of said pivot axes of said one pair of links upon suspension movement of the respective ski, and fixing means fixing the other end of said torsion bar for rotation with one of said links of the other of said pair of links about the corresponding pivot axis of the other ski for rotation of said other end about said other pivot axis upon suspension movement of said other ski, said fixing means causing said torsion bar end to be rotated through substantially the same angle as said one link is pivoted.

4,690,235

THREE-WHEELED MOTOR VEHICLE

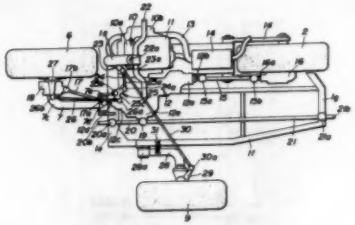
Shinichi Miyakoshi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,628

Claims priority, application Japan, Nov. 6, 1984, 59-233840; Nov. 8, 1984, 59-235907

Int. Cl.[4] B62D *61/06*

U.S. Cl. 180—210 **16 Claims**



1. A motor vehicle comprising:

a steering handle;

a rider's seat disposed behind said steering handle;

a front wheel disposed in front of said steering handle and steerable by the steering handle;

a rear wheel disposed behind said rider's seat and substantially aligned with said front wheel along an axis;

an engine for driving at least said from and rear wheels;

a side runner disposed between said front and rear wheels as seen in side elevation and spaced transversely from said axis;

a steering mechanism for steering said side runner in coaction with said front wheel; and

a structural body supporting said front and rear wheels of said side runner and defining a space located between said axis and said side runner and opening in the longitudinal direction of the motor vehicle.

4,690,236

MOTORCYCLE LUBRICATION SYSTEM

Takashi Shinozaki, and Satoshi Ishikawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,281

Claims priority, application Japan, Sep. 29, 1982, 57-170218; Sep. 29, 1982, 57-17019

Int. Cl.[4] F16N *7/14;* B62D *21/00*

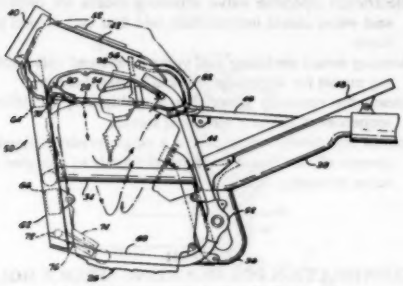
U.S. Cl. 180—219 **1 Claim**

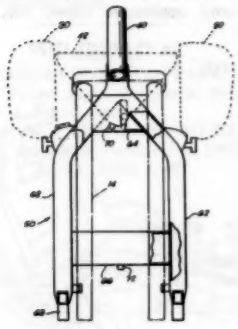
1. A frame for a motorcycle having a front fork suspension and an internal combustion engine with a lubricant supply system, comprising

an oversized down tube assembly sealed to form a fluid tight cavity to provide engine lubricant storage and engine lubricant cooling and including two parallel, mutually spaced down tubes of rectangular cross section spaced apart laterally from the centerplane of the motorcycle wider than the front fork suspension, said down tubes being located to receive air flow during movement of the motorcycle to cool said lubricant passing through said down tube assembly, cross members connecting said parallel down tubes and forming part of said cavity;

a breather port in said down tube assembly and in communication with the lubricant supply system;

an inlet passage means to said cavity from the lubricant supply system of said engine; and





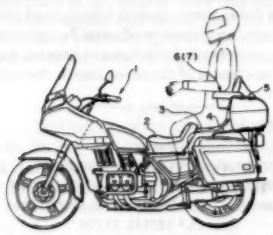
an outlet passage means from said cavity to the lubricant supply system of said engine.

4,690,237

REAR STRUCTURE FOR MOTORCYCLES

Katsunori Funabashi; Tai Nakashima; Toshiyuki Yamada, and Kazuo Morishima, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 608,830, May 10, 1984, abandoned.
This application May 9, 1986, Ser. No. 862,186
Claims priority, application Japan, May 12, 1983, 58-83294; May 12, 1983, 58-83295
Int. Cl.[4] B62J 7/04
U.S. Cl. 180—219 9 Claims



1. A rear structure for a motorcycle having dual seat structure comprising; a driver's seat and a rider's seat, said rear structure further comprising;

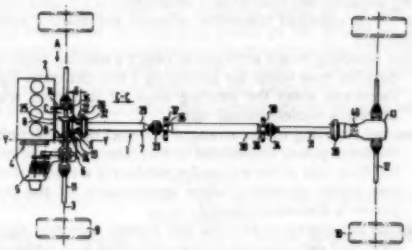
a rear trunk means for receiving therein articles, armrest means for bearing rider's elbows in a natural posture, said rear trunk means including a backrest means for bearing at lest a part of the rider's back, and said armrest means not integral with said rear trunk means; said armrest means including a pair of armrests, said armrests being each detachably coupled to said trunk means.

4,690,238

FOUR-WHEEL DRIVE ARRANGEMENT FOR MOTOR VEHICLES

Rolf von Sivers, Rutesheim; Kim Havemann, Weissach, and Bernhard Ilsemann, Stadtweg, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,009
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1985, 35606727
Int. Cl.[4] B60K 5/04, 17/348
U.S. Cl. 180—248 18 Claims



1. A four-wheel drive arrangement for a motor vehicle, having a transversely mounted internal-combustion engine, comprising:

transmission means for receiving power from the engine and for driving a first set of vehicle wheels; and

angular drive means for receiving power from said transmission means and for driving a second set of vehicle wheels;

wherein said transmission means and said angular drive means are fastened together at an output end and an input end of the respective transmission and angular drive means; and

support means for rigidly supporting a housing of said angular drive means, relative to said internal-combustion engine, at a point distal from said input end of said angular drive means;

wherein said angular drive means includes angular drive gear assembly means and a cardan shaft arrangement connected to an output shaft of the angular drive gear assembly means by a resonance decoupling device; and

wherein said angular drive means includes angular drive gear assembly means having an output shaft supported by bearing means disposed in a supporting neck of the angular drive means housing, said neck extending a distance along a longitudinal axis of the vehicle, said distance being not substantially longer than necessary to provide adequate support for the bearing means, and a connecting element on the output shaft which extends a slight distance beyond an end of the bearing supporting neck.

4,690,239

CONTROL SYSTEM FOR INTERMEDIATE DIFFERENTIAL IN FOUR-WHEEL DRIVE VEHICLE

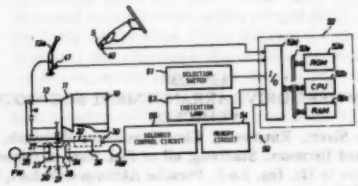
Tokuyuki Takahashi; Koujiro Kuramochi, and Syoichi Sayou, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 22, 1986, Ser. No. 899,012

Claims priority, application Japan, Aug. 23, 1985, 60-129093[U]

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—249 5 Claims



1. A control system for an intermediate differential in drive connection to a power transmission in a four-wheel drive vehicle for transmitting a drive power from a prime mover of the vehicle to front and rear wheel drive axles therethrough, said intermediate differential being provided with a lock mechanism which is operated under control of an actuator to selectively maintain said intermediate differential in a locked condition or an unlocked condition, wherein the control system comprises:

first detecting means arranged to detect a steering angle of a dirigible road wheel for producing a first detection signal therefrom when the steering angle of said road wheel exceeds a predetermined value;

second detecting means arranged to detect disconnection of the drive power transmitted to said intermediate differential from said prime mover for producing a second detection signal therefrom when transmission of the drive power is disconnected; and

means responsive to the first and second detection signals from said detecting means for controlling said actuator in such a manner that said lock mechanism is operated to release the locked condition of said intermediate differential when the steering angle of said road wheel exceeds the predetermined value in a condition where the transmission of the drive power is disconnected.

4,690,240

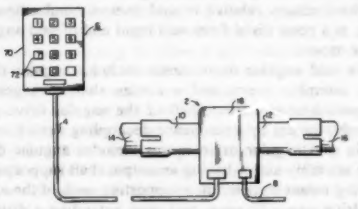
ANTI-THEFT EXHAUST SYSTEM FOR VEHICLES

Rudolph P. Russo, 35 Market St., Poughkeepsie, N.Y. 12601

Filed Apr. 1, 1985, Ser. No. 718,468

Int. Cl.[4] B60R *25/00*

U.S. Cl. 180—287 6 Claims



1. An automotive anti-theft device comprising valve means disposed in the engine exhaust conduit intermediate the exhaust manifold and downstream noise suppression means and displaceable between a first position permitting exhaust gas flow therepast and a second position effectively precluding the flow of exhaust therepast to prevent engine operation;

electrically operable valve actuating means for displacing said valve means intermediate said first and second positions;

housing means enclosing said valve means and valve actuating means for impeding physical access thereto,

means for remotely generating a multiplicity of different sequences of discrete electrical signals;

means selectively responsive to a single predetermined sequence of said discrete electrical signals to energize said valve actuating means.

4,690,241

CONSTRUCTION FOR MOUNTING SERVICE HOLE BLANK CAP OF A CONSOLE BOX

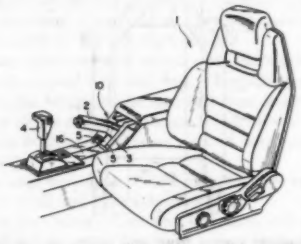
Kazuhiko Miyadera, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 13, 1986, Ser. No. 828,618

Claims priority, application Japan, Feb. 14, 1985, 60-019360[U]

Int. Cl.[4] B62D *25/20*

U.S. Cl. 180—315 17 Claims



1. A construction for mounting a service hole blank cap in a service hole of a console box for a motor vehicle having longitudinal and transverse axes, a longitudinal slit being formed in said console box through which a hand brake lever penetrates, a portion of said slit defining said service hole, the construction comprising a rim defining a periphery of said service hole; an undersurface of a peripheral edge of said blank cap abutting against a top surface of said rim of said service hole; at least one engaging piece formed on an undersurface of said blank cap engaging an undersurface of the rim of the service hole to thereby releasably mount said blank cap on said rim in said service hole; at least one fixing hole being formed in the top surface of the rim on each longitudinal side of said service hole; and said blank cap being formed on the undersurface thereof with at least one fixing piece on each longitudinal side thereof, each having a shape and location adapted for reception within a corresponding one of said fixing holes to prevent longitudinal and transverse movement of the blank cap in the service hole.

4,690,242

SOUND ACTUATED SWITCH

David S. Mark, 194 Sagamore, San Francisco, Calif. 94112

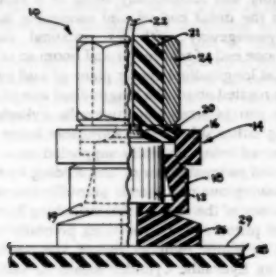
Filed Nov. 19, 1986, Ser. No. 932,730

Int. Cl.[4] H01H *35/24*

U.S. Cl. 181—0.5 7 Claims

1. A sound actuated detector comprising a microphone, a cylinder having a flexible membrane perpendicular to its axis, the cylinder being adapted to fit tightly around the microphone with the sensing surface of the microphone fitting tightly against the flexible membrane, means for affixing the

cylinder to a surface at which sound is to be detected, and a weight connected to the cylinder having a mass such as to



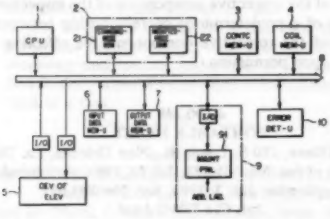
distort the flexible membrane of the cylinder in response to frequencies in a selected range.

4,690,243

ELEVATOR CONTROL APPARATUS

Youichi Ichioka, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1986, Ser. No. 881,212
Claims priority, application Japan, Jul. 8, 1985, 60-149738
Int. Cl.[4] B66B *1/18*
U.S. Cl. 187—101 **8 Claims**



1. A control apparatus for an elevator comprising control calculation means receiving state and control signals from a plurality of operating devices of the elevator to determine operating steps necessary for an elevator service in accordance with a selected mode of operation among standard and special sequences, ladder memory means for storing said standard and special sequences, contact memory means for storing data representing relay contact states, and coil memory means for storing data representing operating states of respective relay coils on the basis of the data of relay contact states and said state and control signals, said ladder memory means including a read only memory for storing said standard sequences and a random access memory for storing said special sequences.

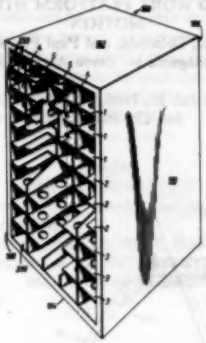
4,690,244

LOUDSPEAKER ENCLOSURES

Laurence G. Dickie, Brighton, England, assignor to B & W Loudspeakers Limited, Brighton, England

Filed Feb. 6, 1986, Ser. No. 826,910
Claims priority, application United Kingdom, Feb. 9, 1985, 8503389
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—146 **25 Claims**

1. A loudspeaker enclosure comprising a rectangular box-like housing consisting of top and bottom walls, front and back walls, left and right side walls, each of the walls being formed by a wooden panel, a hollow stiffening structure located within the housing and extending from the top wall to the bottom wall, from the front wall to the back wall, and from the left side wall to the right side wall, the hollow stiffening structure comprising a first set of spaced-apart stiffening panels arranged with their planes substantially parallel to each other and substantially parallel to the walls of a pair of opposed housing walls, and a second set of spaced-apart stiffening panels arranged with their planes substantially parallel to each other



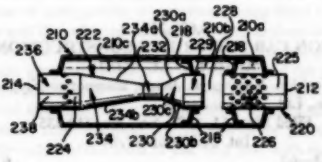
and substantially parallel to the walls of a different pair of opposed housing walls, the stiffening panels of the first set being secured to the stiffening panels of the second set and intersecting them substantially orthogonally so that the stiffening panels, together with the housing walls, define a multiplicity of rectangular parallepipedal cells, holes being provided in the stiffening panels to provide communication between adjacent cells.

4,690,245

FLATTENED VENTURI, METHOD AND APPARATUS FOR MAKING

Edward E. Gregorich, and Timothy R. Maher, both of Longview, Tex., assignors to Stemco, Inc., Longview, Tex.

Continuation of Ser. No. 476,280, Mar. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 366,967, Apr. 9, 1982, abandoned. This application Nov. 14, 1986, Ser. No. 931,903
Int. Cl.[4] F01N *1/08*
U.S. Cl. 181—272 **16 Claims**



4. A muffler defining a portion of a path for exhaust gases from an internal combustion engine comprising a housing and a venturi at least partially within the housing defining a path for exhaust gases passing through the housing, the venturi having a centerline, an inlet section at one end to admit exhaust gases, an outlet section at an opposing end to release exhaust gases, a throat section intermediate the inlet section and the outlet section having a transverse cross-sectional area normal to the centerline less than the transverse cross-sectional area normal to the centerline in either the inlet section or the outlet section, a reduction chamber section connecting said inlet section and said throat section and diminishing in transverse cross-sectional area normal to the centerline between the inlet section and the throat section, and an expansion chamber section connecting said throat section and said outlet section

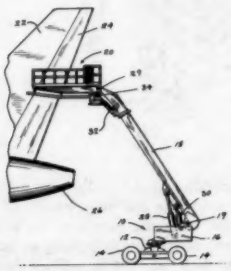
and increasing in transverse cross-sectional area normal to the centerline between the throat section and the outlet section, the improvement wherein the venturi is formed from a single length of tubing having a uniform transverse circumferential wall length in planes normal to the centerline at each point along the centerline.

4,690,246

ARTICULATED WORK PLATFORM WITH SCISSORS MOTION

John T. Hornagold, Delafield, and Paul Pezewski, Milwaukee, both of Wis., assignors to Simon Aerials, Inc., Milwaukee, Wis.

Filed Jul. 11, 1985, Ser. No. 754,024
Int. Cl.[4] B66F *11/04*
U.S. Cl. 182—2 **22 Claims**



1. A work platform suitable for mounting on a base, comprising:

a pair of side platform sections each having one end adjacent said base and its other end extending from said base, said side platform sections being movable toward and away from each other between a first position in which said side platform sections are adjacent one another and a second position in which said side platform sections diverge in a direction away from said one ends;

pivotal mounting means for pivotally mounting said one ends of said side platform sections to said base; and

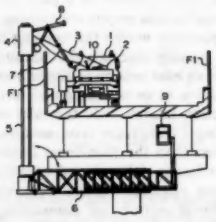
a fixed platform section mounted adjacent said one ends of said side platform sections and above said pivotal mounting means.

4,690,247

INSPECTION CAR FOR BRIDGE CONSTRUCTION OF A HIGH LEVEL ROAD

Katunori Yoshida, Kumagaya, Japan, assignor to Nippon Light Metal Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1985, Ser. No. 710,235
Int. Cl.[4] B66F *11/04*
U.S. Cl. 182—63 **6 Claims**



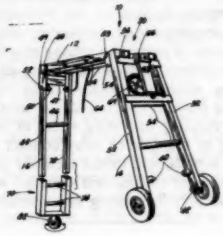
1. An inspection car for inspecting bridge construction of a high level road comprising a rotatable pedestal rotatably mounted on a chassis about a vertical axis, a vertically swingable and extensible boom with its proximal end pivotally mounted on said rotatable pedestal, a reciprocal boom longitudinally slidably and reciprocally fitted in a saddle pivotally mounted on the distal end of said swingable boom, and an inspection passageway with its proximal end pivotally mounted on one end of said reciprocal boom so as to be swung in the vertical longitudinal center plane of said passageway as well as to be rotated about the longitudinal axis of said reciprocal boom, a pair of stretching hydraulic cylinder means arranged along either side of said swingable boom with one of the ends thereof being pivotally supported on a distal boom member of said swingable boom, and folding hydraulic cylinder means having one of the ends pivotally connected to said saddle, the other of the ends of said stretching hydraulic cylinder means or piston rods therof being pivotally connected to said folding hydraulic cylinder means, the portion at which said stretching hydraulic cylinder means or said piston rods thereof are pivotally connected to said folding hydraulic cylinder means being relatively swingably connected through connecting links to the portion at which said hydraulic cylinder means being pivotally connected between the forward ends of the respective piston rods or the stretching hydraulic cylinder means, a control device comprising a detecting station for detecting and ascertaining at least the rotational angle of said swingable boom about the rotational axis of said rotatable pedestal, the vertical swinging angle of said swingable boom, the angle formed between the longitudinal axis of said reciprocal boom and said swingable boom, and the rotational angle of said passageway about said reciprocal boom, and a discriminating station adapted to receive the detected signals from said detecting station so as to judge the permission/inhibition of movements of the respective components of the inspection car on the basis of a predetermined correlationship between the movements of the respective components for effecting such movements upon permission.

4,690,248

PORTABLE HOIST

Walter H. Killeen, 210 S. Lopez St., New Orleans, La. 70119

Continuation of Ser. No. 631,852, Jul. 18, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 881,691
Int. Cl.[4] E04G *1/08*
U.S. Cl. 182—118 **6 Claims**



1. A portable apparatus for lifting, transporting and distributing a load, comprising:

a. a horizontal frame support having parallel side rails connected by transverse supporting members;

b. a first ladder shaped leg, having a pair of side rails connected by transverse supports and extending transversely away from said side rails of said horizontal support, thereby forming a base on said first leg being wider than said horizontal frame support, said first leg being, pivotally connected to a first end of said horizontal frame support and moveable between a first folded inoperative position and a second unfolded operative position, said first leg extending downwardly from said horizontal

frame support when in said second operative position, said first leg including first and second telescopically mating members, whereby the length of said first leg is selectively adjustable;

c. a second ladder shaped leg, having a pair of spaced parallel side members connected by transverse supports, and pivotally connected to the other end of said horizontal frame support and moveable between a first folded inoperative position and a second unfolded operative position, said second leg extending downwardly from and substantially perpendicular to said horizontal frame member when in said second operative position;

d. means operatively connected to said first leg and said horizontal support for lifting and lowering a load, including a first pulley fixedly mounted on said horizontal frame member and a second pulley mounted on said horizontal frame member and moveable longitudinally therealong;

e. means connected to said first leg for transporting said apparatus and said load;

f. means for communication of said second leg with the ground, forming a support for lifting a load, said communication means comprising a generally ladder shaped bracket engageable with a ladder-like structure and said second leg, and being selectively adjustable in length whereby said load is distributed over both said first and second leg members and the ground when said first leg rests on a surface when is elevated with respect to the ground; and

g. means for locking said first and second legs in said second unfolded operative position, further comprising:

a. a pair of spring loaded latches extending through said side rails of said horizontal support;

b. said first leg having apertures for receiving said latches;

c. a pair of spring loaded latches extending through said side members of said second leg; and

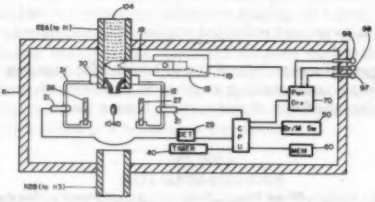
d. a pair of flanges connected to said side rails of said horizontal support having apertures therethrough for receiving said latches said portable apparatus in said first folded inoperative position is transportable on the back of a user.

4,690,249

PRECISELY RECURRENTLY CONTROLLABLE DROPWISE LIQUID-FEEDERS

Theodore D. Olson, Jr., R.R. #4, Atkinson, Nebr. 68713

Filed May 20, 1986, Ser. No. 865,003
Int. Cl.[4] F16N *29/04*
U.S. Cl. 184—6.4 **8 Claims**



1. Precisely recurrently controllable dropwise oiler for machinery having an optimal-requirement expressed in optimal-drops/minute of oil to be gravitationally fed into said machinery through an oil intake-line, said controlled dropwise oiler comprising:

(A) a reservoir for oil and an outlet-line therefor and both being disposed at an elevation loftier than for said machinery intake-line, said outlet-line having a lower outlet-length portion including an outlet-end communicating with a drop-former located above and in gravitational alignment with said machinery intake-line, there being a finite vertical-gap between said drop-former and said intake-line, and said outlet-length above said drop-former being provided with a reciprocatable plunger-valve;

(B) a timer of the type arbitrarily settable to register recurring time-periods expressed as seconds/drop for said optimal-requirement;

(C) a solenoid actuatably connected to said reciprocatable plunger-valve;

(D) solenoid control means for selectively varying at least the duration that said plunger-valve permits oil to flow along said outlet-length and to said drop-former during each recurring time-period, whereby an actual-drops/minute oil flow in the form of oil falling dropwise from said drop-former is achieveable for each time-period; and

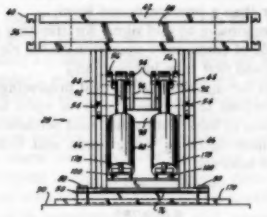
(E) detection means for electronically detecting the presence of each said falling oil droplet.

4,690,250

VEHICLE BENCH LIFT

Hans R. Bergstrom, Kungsor, Sweden, assignor to Car-O-Liner Company, Wixom, Mich.

Continuation of Ser. No. 722,739, Sep. 5, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 5,234
Int. Cl.[4] B66B *11/04*
U.S. Cl. 187—18 **11 Claims**



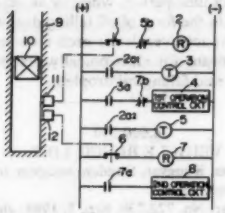
1. A lift for raising and lowering a bench frame with a pair of laterally spaced apart and longitudinally extending rails comprising: a base, a first pair of arms laterally spaced apart and adjacent one end each pivotally connected to one of said base and frame and adjacent the other end each slidably connected to the other for said base and frame, a second pair of arms laterally spaced apart and adjacent one end each pivotally connected to said other of said base and frame and adjacent the other end each slidably connected to said one of said base and frame, one of said pivotal connections being fixed relative to said base and the other of said pivotal connections being fixed relative to said frame, said slide connections being movable along paths generally parallel to each other and the longitudinal axes of said rails, a first pivot pivotally connecting one of the arms of said first pair with one of the arms of said second pair adjacent their midpoints, a second pivot pivotally connecting the other of the arms of said first pair with the other of the arms of said second pair adjacent their midpoints, said first and second pivots being separate from, spaced apart from, independent of, unconnected to and coaxial with each other, a pair of fluid actuated cylinders each having a piston rod and a case and being received between said arms, one of the piston rod and case of each cylinder being pivotally connected with one of the arms of one pair of said arms and the other of the piston rod and case of each cylinder being pivotally carried by said base, at least one of the pivotal connections of each cylinder being offset from a straight line intersecting the axis of said first and second pivots at the midpoints of the arms and the axis of each pivotal connection of the other pair of arms with one of the base and frame, and all of said arms and cylinders being constructed and arranged such that they are received between and within the vertical height of the rails of the bench frame when the lift and bench frame are fully lowered.

4,690,251

EMERGENCY CONTROL SYSTEM FOR ELEVATORS

Yoshimitsu Onoda, Toride, and Hiroshi Goko, Tokyo, both of Japan, assignors to Hitachi, Ltd. and Hitachi Engineering and Service Co., Ltd., both of Tokyo, Japan

Filed Apr. 10, 1986, Ser. No. 850,096
Claims priority, application Japan, Apr. 10, 1985, 60-74303
Int. Cl.[4] G01P *15/00*
U.S. Cl. 187—107 5 Claims



1. An emergency control system for an elevator comprising:

signal producing means for producing a signal in response to vibration of a structure in which the elevator is installed when the vibration of the structure is at a level in magnitude larger than a predetermined level;

first means responsive to said signal for effecting a predetermined mode of emergency operation on the elevator for a predetermined first time interval; and

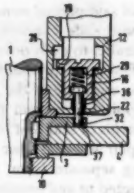
second means for disabling said signal producing means for a predetermined second time interval upon initiation of the operation of said first means, said predetermined second time interval being longer than said first predetermined time interval.

4,690,252

ROTATION-PREVENTING LOCKING DEVICE FOR A PORTABLE TOOL

Joachim Kottke, Remseck, and Gerhard Zerrer, Korb, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Dec. 20, 1985, Ser. No. 811,377
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447154
Int. Cl.[4] B62C *7/02*; F16D *69/00*; B23B *29/24*; F16M *21/44*
U.S. Cl. 188—69 15 Claims



1. A rotation-preventing locking device for releasably locking a rotatably journalled output drive member of a hand-held portable tool such as a brushcutter or the like, the portable tool having a structure which is stationary relative to the rotatably journalled output drive member, the locking device comprising:

a blocking piece mounted on said structure so as to be movable between a blocking position whereat said blocking piece engages said output drive member for blocking the latter against rotation and a clear position whereat said blocking piece is disengaged from said member so as to permit the latter to rotate freely;

said blocking piece being a blocking pin defining a longitudinal axis and having respective end faces on corresponding longitudinal ends thereof, said blocking pin being mounted on said structure so as to be displaceable between said positions along said axis;

blocking bore means formed in said member for receiving said blocking pin in said blocking position thereof;

releasable latching means disposed on said structure for latching and holding said blocking pin in said blocking position, said latching means including:

a housing on said structure;

an actuating member movably mounted in said housing between an unlatched position and a latched position for actuating said blocking pin between said clear position and said blocking position; and,

resilient means interposed between said blocking pin and said actuating member for resiliently biasing said pin toward said blocking position;

said actuating member being a cylinder-like member having a top wall at one end thereof and being movably mounted in said housing vis-a-vis said blocking pin so as to telescopically receive the latter therein, said resilient means being interposed between said top wall and one of said end faces of said blocking pin; and,

guide means for guiding said actuating member in said housing between said unlatched and latched positions; and,

engaging means formed on said housing and on said actuating member for engaging said actuating member to hold the same in said latched position.

13. A rotation-preventing locking device for releasably locking a rotatably journalled output drive member of a hand-held portable tool such as a brushcutter or the like, the portable tool having a structure which is stationary relative to the rotatably journalled output drive member, the locking device comprising:

a housing on said structure;

a blocking piece movably mounted in said housing so as to be movable between a blocking position whereat said blocking piece engages said output drive member for blocking the latter against rotation and a clear position whereat said blocking piece is disengaged from said member so as to permit the latter to rotate freely;

releasable latching means disposed on said housing for latching and holding said blocking pin in said blocking position, said latching means including:

an actuating member movably mounted in said housing between an unlatched position and a latched position for actuating said blocking piece between said clear position and said blocking position;

resilient biasing means for resiliently biasing said actuating member into said unlatched position; and,

guide means for guiding said actuating member in said housing between said unlatched position and said latched position; and,

engagement means formed in said housing for engaging and holding said actuating member in said latched position against the force of said resilient biasing means.

4,690,253

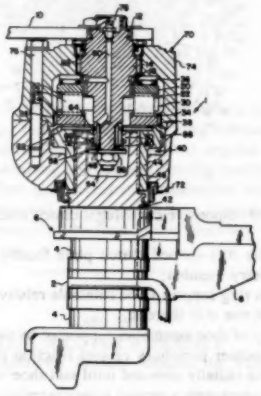
BRAKE ACTUATOR

James L. Weber, West Bloomfield, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1985, Ser. No. 769,526
Int. Cl.[4] F16D *55/08*
U.S. Cl. 188—72.7 5 Claims

1. Roller cam actuator apparatus for a disc brake caliper assembly comprising a housing, a shaft in said housing mounted for rotation to said disc brake caliper assembly, a lever means connected to said shaft, means for connecting the lever means to the shaft for rotating the shaft upon rotating movement of the lever means, said connecting means including radially directed spline means connected to the shaft, said shaft having a relatively large portion near said lever means where it is mounted for rotation, roller bearing means for said shaft

surrounding said large portion, rotor means in said housing having inward facing spline means for connecting the rotor means to the shaft, stator means in said housing aligned in parallel to the rotor means, means connecting the stator means to the housing to prevent relative rotation of the stator means in respect to said caliper assembly, said caliper assembly having a large central cavity, said shaft having spline means mounted thereon axially adjacent the relatively large portion of said shaft adjacent the roller bearing means rotatably mounting said rotor means thereto, said shaft being reduced in the next axial inward position adjacent the spline means, a roller mounting means being mounted on the reduced portion of said shaft, the stator means and rotor means having opposed axial faces spaced apart at a predetermined distance, the opposed faces having complementary cam grooves therein, roller means mounted between the faces and positioned in the complementary cam grooves whereby as the rotor is turned by the



shaft, the cam grooves turn the roller means and move the roller means with respect to the faces, whereby the roller means moving in the cam grooves causes the faces to separate and urge the stator and rotor axially apart, bearing means on said shaft means adjacent the rotor and said roller means further comprising annular cage means having a central opening for mounting on the bearing means and further having plural rollers, retaining means for holding said plural rollers in radial alignment and for contacting the cam grooves in the opposite faces of the rotor and stator, thrust bearing means connected between the rotor means and the caliper assembly for preventing relative axial movement of the rotor and the caliper assembly said means connecting the stator means to the housing including sliding means connected between the stator means and the caliper assembly for permitting relative sliding of the stator means with respect to the caliper assembly, and pressure means in contact with the surface of the stator means for urging a piston in a brake applying direction.

4,690,254

PAD SPRING FOR A DISC BRAKE WITH A SLIDING CALIPER, AND DISC BRAKE EQUIPPED WITH SUCH A SPRING

Marc Couvez, Aubervilliers, France, assignor to Societe Anonyme D.B.A., Paris, France

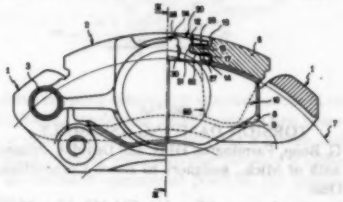
Continuation of Ser. No. 755,955, Jul. 16, 1985, abandoned, which is a continuation of Ser. No. 525,202, Aug. 22, 1983, abandoned. This application Jun. 16, 1986, Ser. No. 874,880

Claims priority, application France, Sep. 30, 1982, 82 16450

Int. Cl.[4] F16D *65/02*

U.S. Cl. 188—73.36 **4 Claims**

1. A disc brake of the type incorporating a caliper housing a brake motor, said caliper slidingly supported on a fixed support via at least two axial slide surfaces on the caliper and on the fixed support, two friction pads anchored and able to slide in an opening of the fixed support for selective friction engagement with a disc rotating around an axis, each pad having an upper edge with a substantially central radially outwardly extending protuberance, the caliper having an intermediate portion in the form of an arch straddling the disc and the pads and having, directly above the friction pads, a central opening of reduced circumferential width, relative to the circumferential extent of said arch, limited by facing lateral sides, one of said lateral sides being formed with radially opposed recesses defining therebetween in said arch a lateral web portion of reduced radial thickness, and a pad spring made out of a spring leaf and comprising a cantilevered portion bearing against said protuberance of each pad projecting, in a mounting position in



the brake, radially at least partially into said opening, and a lateral mounting portion with integrally formed mounting wings forming a U-shaped channel so that the wings are elastically grippingly mounted on said lateral web portion, the mounting wings having radially spaced-apart planar surfaces which engage corresponding radially spaced-apart surfaces of the lateral web portion, the spring being attached to the caliper at only the lateral web portion of the caliper, one of said wings reversely formed to extend in an opposite direction relative to the U-shaped channel and extend into said cantilevered portion which projects transversely across said opening and forms, adjacent a free end, a line of contact with tops of said protuberances and which is continuous and parallel to said axis of said disc.

4,690,255

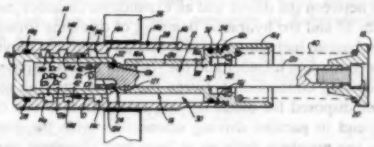
COMPACT SHOCK ABSORBER

Robert J. Heideman, Westland, Mich., assignor to Enertrols, Inc., Westland, Mich.

Filed Mar. 10, 1986, Ser. No. 838,267

Int. Cl.[4] F16F *9/44*

U.S. Cl. 188—287 **13 Claims**



1. In a shock absorber of the type including an inner tube closed at closed at its rearward end and open at its forward end; a piston rod and piston head assembly slidably received in the inner tube with the rearward end of the piston head spaced from the closed rearward end of the inner tube and the piston rod projecting forwardly out of the open forward end of the inner tube for impact by a moving object; an outer tube surrounding the inner tube; a cushioning fluid substantially filling the shock absorber; metering means in the inner tube coating with metering means in the outer tube to define a plurality of metering orifices; and adjusting means providing relative movement between the inner and outer tubes and operative in response to such relative movement to selectively vary the

respective relative positions of the metering means in the inner tube relative to the coacting respective metering means in the outer tube to thereby vary the size of the metering orifices and thereby selectively vary the impact resistance generated by the movement of the cushioning fluid through the metering orifices in response to impacting movement of the piston assembly toward the closed rearward end of the inner tube; the improvement wherein:

(A) an annular accumulator chamber is provided in said shock absorber radially outwardly of said piston assembly at a longitudinal location forwardly of said metering orifices; and

(B) means are provided for routing cushioning fluid from said metering orifices axially forwardly between said inner and outer tubes to said annular accumulator chamber.

4,690,256

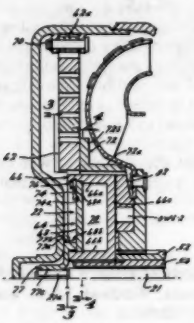
TORSION DAMPING ASSEMBLY

Warren G. Bopp, Farmington Hills, and David A. Janson, Plymouth, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 734,440, May 16, 1985, abandoned. This application Aug. 30, 1985, Ser. No. 771,373

Int. Cl.[4] F16D *3/14, 33/00, 47/02*

U.S. Cl. 192—21 22 Claims



1. An assembly disposed for driving connection between rotatably mounted input and output driven of a driveline; the assembly including resilient means for transmitting driveline torque between the drives and an expandable chamber mechanism for to and fro hydraulic damping of driveline torsionals; the mechanism including first and second relatively moveable members, the first member and the resilient means disposed for serial driving connection between the drives, and the second member disposed for direct driving connection to one of the drives and in parallel driving connection with the resilient means; the members defining at least two chambers varying inversely in volume in response to flexing of the resilient means and containing an incompressible fluid for damping driveline torsionals in responsee to the volumes varying; characterized by:

the driveline including a housing assembly having a compartment containing said incompressible fluid under pressure during driveline operation; the mechanism being disposed in said compartment; and means providing restricted communication of the fluid in said variable volume chambers with the pressurized fluid in said compartment, whereby said variable volume chambers are continuously charged with said pressurized fluid during driveline operation.

4,690,257

SPEED RESPONSIVE CENTRIFUGAL CLUTCH WITH A SERIAL CIRCUMFERENTIAL ARRANGEMENT OF SHOE ASSEMBLIES AND DAMPERS

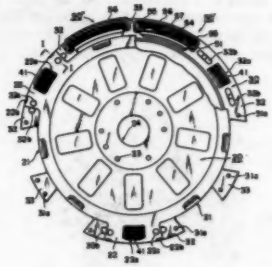
Akimitsu Suzuki; Toshio Awaji, and Kozaburo Igari, all of Fujisawa, Japan, assignors to NSK-Warner Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1985, Ser. No. 757,035

Claims priority, application Japan, Jul. 20, 1984, 59-149617

Int. Cl.[4] F16B *43/18*

U.S. Cl. 192—3.31 12 Claims



1. A speed responsive centrifugal clutch assembly, comprising:

a generally disk-shaped clutch plate fixedly mounted on a first rotary member;

a reaction ring support to be rotatable relative to said clutch plate at one side thereof;

a plurality of shoe assemblies supported by said reaction ring on an outeer periphery of said reaction ring so as to be movable radially outward until said shoe assemblies come into contact with a second rotary member as the centrifugal force acting thereon increases;

a plurality of damper members operatively associated with said clutch plate and said reaction ring thereby transmitting a rotational force between said clutch plate and said reaction ring; and

wherein said plurality of shoe assemblies and said plurality of samper members are spacedly disposed one after another substantially along the same circumference of said reaction ring, in series and independently from one another.

4,690,258

HYDRAULIC POWER TRANSMISSION DEVICE WITH CENTRIFUGALLY ACTUATED CLUTCH OVERRIDE

Masao Teraoka, Sano, and Yukio Yuhashi, Kitasaitama, both of Japan, assignors to Tochigifujisangyo Kabushikigaisha, Tochigi, Japan

Filed May 23, 1986, Ser. No. 867,336

Claims priority, application Japan, May 27, 1985, 60-112138; Apr. 10, 1986, 61-81127

Int. Cl.[4] F16D *37/00, 19/00*

U.S. Cl. 192—58 C 5 Claims

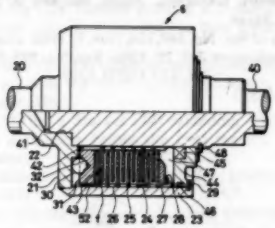
1. A hydraulic power transmission device with a centrifugally actuated clutch override, comprising:

first and second coaxially arranged independently rotatable shaft assemblies, said shaft assemblies being provided respectively with first and second wall members defining a chamber adapted to contain a viscous fluid;

first and second mutually spaced discs alternately arranged in said chamber, said first and second discs being respectively connected to and rotatable with said first and second shaft assemblies, with the viscous resistance of the fluid in said chamber providing a rotational driving con-

nection between said first and second discs and their respective shaft assemblies; and

clutch means arranged between said shaft assemblies, said clutch means including at least one clutch member carried on said first shaft assembly at a location surrounded by a circumferential surface on said second shaft assembly, said clutch member being movable radially outwardly into



engagement with said circumferential surface in response to centrifugal forces developed during rotation of said first shaft assembly above a selected angular velocity, thereby establishing a rotational driving connection between said first and second shaft assemblies which overrides the rotational driving connection derived from the viscous resistance of the fluid in said chamber.

4,690,259

CLUTCH COVER ASSEMBLY

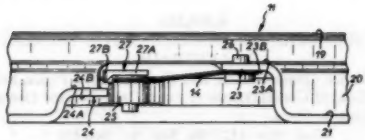
Jacky Naudin, Asnieres, France, assignor to Valeo, Paris, France

Filed May 13, 1985, Ser. No. 733,190

Claims priority, application France, May 18, 1984, 84 07742

Int. Cl.[4] F16D *13/69*

U.S. Cl. 192—70.28 **11 Claims**



1. A clutch cover assembly adapted to rotate about an axis of rotation, comprising a hollow cover including an annular endwall and a skirt having openings each circumferentially bordered by a retaining lug and a fixing lug, associated ones of said retaining and fixing lugs being axially and circumferentially offset relative to one another, a pressure plate having radially projecting tabs passing through said openings in said skirt, resilient clamping means urging said pressure plate in an axial direction away from said endwall of said cover, axially flexible circumferential straps attached at their ends by fixing members respectively to said fixing lugs on said cover and to said projecting tabs on said pressure plate and coupling said pressure plate for rotation with said cover walls permitting relative axial movement, circumferentially extending axial retaining members for limiting displacement of said pressure plate away from said endwall of said cover to a predetermined distance, and said axial retaining members each being an integral part of said fixing means fixing said straps to said tabs of said pressure plate and adapted to abut axially against said retaining lugs of said cover to limit displacement of said pressure plate.

4,690,260

RADIAL ENGAGEMENT DRIVE COUPLER

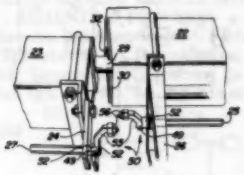
Donald K. Landphair, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 592,696, Mar. 23, 1984, abandoned.

This application May 15, 1986, Ser. No. 863,637

Int. Cl.[4] A01B *73/06*; F16D *3/16*

U.S. Cl. 192—71 **11 Claims**



1. In a drive coupling mechanism adapted for use in conjunction with a folding implement frame having a first beam carrying a drive shaft, a second beam carrying a driven shaft, said first and second beams being movable between a folded position and an unfolded operational position, the improvement comprising:

means for axially aligning said drive shaft and said driven shaft in closely spaced end-to-end relationship when said frame is in said operational position;

a pair of drive couplers, one coupler being attached to said drive shaft and the other coupler being attached to said driven shaft, each of said couplers including:

a contact head having a pair of drive faces and a pair of inner guide faces interconnected between the inner edges of said drive faces;

said pair of couplers being disposed such that their respective drive faces contact each other in an engaged driving mode when said frame is in said operational position.

4,690,261

SHIP PROPULSION TRANSMISSION WITH AT LEAST ONE ENGAGEABLE FRICTION CLUTCH

Rudolf Peter; Ernst Jahnel, and Hans-Peter Kunz, all of Augsburg, Fed. Rep. of Germany, assignors to Zahnraderfabrik Renk AG, Fed. Rep. of Germany

Filed Feb. 21, 1986, Ser. No. 831,563

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505987

Int. Cl.[4] F16D *25/11*

U.S. Cl. 192—87.13 **5 Claims**

1. A ship propulsion transmission system comprising:

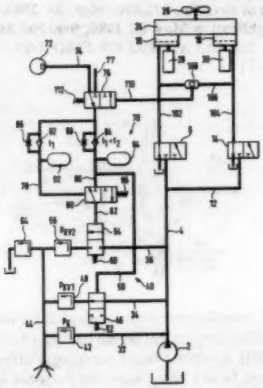
at least one engageable friction clutch in a drive line between a ship engine and a ship propeller, comprising:

means for delivering a pressurized fluid from a pressure source through a pressure medium line to the friction clutch to actuate it,

setting means for setting the operating pressure of said delivered pressurized fluid during the starting up of the power transmission, and

said setting means including means for setting the fluid pressure at a plurality of different operating stages, in sequence, at least the first two of which stages are maintained for a predetermined time, wherein during the first stage pressure is maintained at a peak level, during the

second stage pressure is maintained at an intermediate level and during the final stage pressure is maintained at a



final level which is higher than that during any said intermediate stage.

4,690,262

CLUTCH CONTROL CABLE WITH AUTO-ADJUSTER

Edgar Hoyle, 193 The Street, Boughton, Faversham, Kent, ME13 9BH, United Kingdom

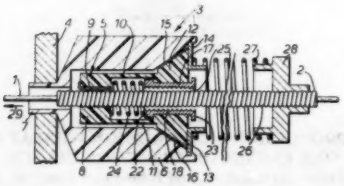
PCT No. PCT/GB85/00005, § 371 Date Sep. 5, 1985, § 102(e) Date Sep. 5, 1985, PCT Pub. No. WO85/03113, PCT Pub. Date Jul. 18, 1985

PCT Filed Jan. 4, 1985, Ser. No. 774,600

Claims priority, application United Kingdom, Jan. 5, 1984, 8400134

Int. Cl.[4] F16D *11/00*

U.S. Cl. 192—111 A **15 Claims**



1. An engine clutch control cable which comprises a flexible movement-transmitting core **(1,33,50,58,71)** within a flexible guiding conduit **(2,35,49,57,78)** and which is associated with a self-adjustment device comprising a clamp **(3)** via which the conduit can be connected to an abutment **(4,30,38,60,77)** for sustaining reaction load on the conduit **(2,35,49,57,78)**, which clamp automatically closes and opens in dependence on axial advance and retraction movements respectively of a component **(5,41,62,73)** of the clamp **(3)** during a movement cycle of the cable core **(1,33,50,58,71)** when the cable is in use, characterised in there is a slip coupling **(9,51–52,74)** between said clamp component **(5,41,62,73)** and the conduit **(2,35,49,57,78)** of the cable, by which coupling, when the cable is in use, axial advancing motion of a part of said conduit which occurs responsive to application of load to the cable at the start of the clutch-disengaging stroke of the core **(1,33,50,58,71)** is transmitted from conduit part to said clamp component **(5,41,62,73)** thereby advancing such component, and such transmited motion results in closure of the clamp **(3)**; and in that there is (i) means **(27,45,66,79)** for biasing said conduit part towards retraction from the clamp, and (ii) means **(17–18,24; 47–48; 70)** which allows the position along said conduit **(2,35,49,57,78)** at which it is engaged by said slip coupling **(9,51–52,74)** when the control is in its rest position to alter from cycle to cycle under end-of-cycle load on the cable resulting from clutch wear.

4,690,263

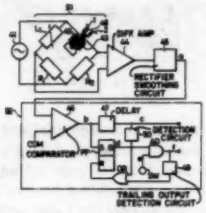
COIN REFUND SIGNAL GENERATOR

Shinji Yokomori, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Japan

Continuation of Ser. No. 549,724, Nov. 8, 1983, abandoned. This application Jul. 21, 1986, Ser. No. 885,732

Int. Cl.[4] G07D *5/08*

U.S. Cl. 194—317 **13 Claims**



1. A coin refund signal generator for use with a vending machine having a coin deposit opening, a coin processing path connected to the coin deposit opening, and a coin return requesting means, the refund signal generator comprising:

coin sorting sensing means in said coin processing path for generating a sensing signal having a first value or a second value, said sensing signal being generated with said second value in response to the deposit of a coin in the coin deposit opening and also in response to the operation of the coin return requesting means; and

detection circuit means for generating a coin refund signal in response to said sensing signal having said second value for longer than a predetermined time period.

4,690,264

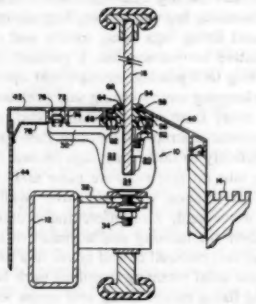
MULTIFUNCTION GLASSHOLDER FOR ESCALATOR BALUSTRADE

Willy Adrian, Obernkirchen, and Gerald Wente, Pohle, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Mar. 31, 1986, Ser. No. 846,396

Int. Cl.[4] B66B *9/14*

U.S. Cl. 198—335 **3 Claims**



1. An escalator comprising a truss **(12)**, a balustrade **(16)** disposed inward of the truss **(12)**, a step **(14)** disposed inward of

the balustrade (16), a glassholder (10) attaching the balustrade (16) to the truss (12), an inward decking profile (40) extending inwardly and downwardly from the balustrade (16) towards the step (14), an outward decking profile (42) extending outwardly from the balustrade from a point opposite the outward edge of the inward decking profile (40), and an exterior cladding profile (44) extending downwardly from the outward edge of the outward decking profile (42), characterized in that:

the glassholder (10) has a base portion (24), an upwardly-extending inward leg (20) and an upwardly-extending outward leg (22), thereby forming a U-shaped longitudinal channel (18) for receiving the base portion of balustrade;

the glassholder (10) has clamping means (26) disposed in the inward leg (20) for securing the balustrade (16) in the glassholder (10);

the truss (12) has a bracket (32) extending inwardly therefrom to a position below the base portion (24) of the glassholder;

the glassholder (10) is attached by its base portion (24) to the bracket (32);

a first piece (54) abutting one side of the balustrade (16) and containing a slot to receive the edge of the inner decking profile (40);

the glassholder (10) has a spring clip (52) disposed in the upward surface of the inward leg (20) that extends into a slot 56 in the first piece (54);

a second piece (64) abutting one side of the balustrade (16) and containing a slot for receiving the edge of the outer decking profile (42);

the glassholder (10) has a spring clip (62) disposed in the upward surface of the outward leg (22) that extends into a slot in said second piece.

4,690,265

PACKET HANDLING APPARATUS

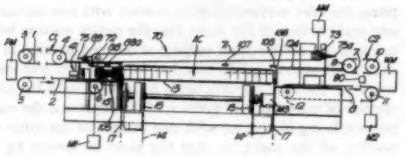
David Gayfer; Stanley V. Starkey, and John G. Wareham, all of London, England, assignors to Molins PLC, London, Great Britain

Filed Aug. 10, 1984, Ser. No. 639,358

Claims priority, application United Kingdom, Aug. 11, 1983, 8321675

Int. Cl.[4] B65G 47/57

U.S. Cl. 198—347 **27 Claims**



1. Packet handling apparatus comprising an accumulator having a plurality of compartments for receiving and storing batches of packets, means defining a delivery path on which packets are moved towards said accumulator, reversible drive means for moving successive compartments into a transfer position in alignment with said delivery path, means defining a receiving path on which packets are moved away from the accumulator, first and second conveying means each being arranged for conveying packets along at least part of the delivery path and through a compartment at the transfer position, said second conveying means including at least one pusher movable through a compartment at the transfer position, and control means for operating a selected one of said first and said second conveying means according to the operating condition of the accumulator, so that either said first or said second conveying means conveys packets along said part of the delivery path and through a compartment at said transfer position said control means including first detector means comprising spaced sensors for detecting a complete batch of packets upstream of said transfer position and second detector means downstream of said first detector means for detecting when said complete batch has moved to said transfer position.

4,690,266

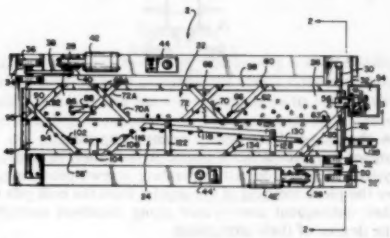
BELT CONVEYOR HAVING ARTICLE SORTING AND ORIENTING FEATURES

Stanley W. T. Croman, Dillsburg; Janet M. Jordan, Camp Hill, and Edward J. Paukovits, Jr., Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 26, 1981, Ser. No. 314,602

Int. Cl.[4] B65G 47/24

U.S. Cl. 198—388 **10 Claims**



1. A belt conveyor for conveying articles from a loading zone along a conveyor path, the conveyor being of the type having first and second conveyor belts in side-by-side adjacent relationship, the belts each having a first end and a second end, the first ends being adjacent to each other and the second ends being adjacent to each other, the first belt being movable in a direction extending away from its first end, the second belt being movable in a direction extending towards its first end, the loading zone being at the first end of the first belt, the loading zone being at a level below the level of the first end of the second belt, the articles having first and second stable attitudes on the first belt when delivered to the loading zone, the conveyor being characterized in that:

a sorting guide extends transversely across the first belt towards the second belt at a location spaced from the loading zone, the sorting guide having a gate therein which permits articles in the first stable attitude to pass the sorting guide and which prevents articles in the second stable attitude from passing the sorting guide, the sorting guide having guiding surfaces which guide articles in the second stable attitude laterally on the first belt towards and onto, the second belt,

a transfer guide is provided at the second end of the first belt having transfer guide surfaces which guide articles laterally of the first belt and onto the second belt whereby transferred articles in the first stable attitude are carried from the second end of the second belt to the first end of the second belt, a discharge station is provided at the first end of the second belt for discharging articles in the first stable attitude, the second belt having a series of article guides in spaced relationship to the surface thereof for guiding the articles to the discharge station, and

a return guide is provided on the second belt at the first end thereof having guiding surfaces which guide any articles in the second stable attitude, which passed the sorting guide, laterally of the second belt and towards the loading zone whereby the articles fall onto the loading zone on the first belt and at least some of the articles will have the first stable attitude when they arrive in the loading zone.

4,690,267

CHARGING-AND-CONVEYING MEANS

Vladimir T. Gradoboev, ulitsa Kropotkina, 120/1, kv. 86; Alexandr E. Sitnikov, ulitsa Leskova, 250, kv. 39; Alexandr M. Klimenov, ulitsa Nevelskogo, 5, kv. 45, and Leonid I. Melnikov, ulitsa Dm. Donskogo, 19, kv. 19, all of Novosibirsk, U.S.S.R.

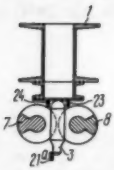
PCT No. PCT/SU85/00011, § 371 Date Oct. 28, 1985, § 102(e) Date Oct. 28, 1985, PCT Pub. No. WO85/04155, PCT Pub. Date Sep. 26, 1985

PCT Filed Feb. 13, 1985, Ser. No. 796,020

Claims priority, application U.S.S.R., Mar. 13, 1984, 3709443

Int. Cl.[4] B65G *47/14*

U.S. Cl. 198—396 **4 Claims**



1. A charging-and-conveying means comprising

a hopper for piece articles placed in bulk therein, and

a system of synchronously operating screws providing for by-the-piece removal of the articles from the bulk pile and their subsequent conveyance along members restricting the degree of their movement,

said system including a first pair of screws positioned relative to each other with their turns mutually overlapping to effect the removal of the articles from the pile, said first pair of screws rotating towards each other, one of said members being positioned in an overlap zone of said first pair of screws and orienting the articles being conveyed by said first pair of screws, a second pair of screws effecting the continued conveyance of the articles from said first pair of screws and said second pair of screws having an area for accumulation of the articles, and guides arranged along said said second pair of screws.

4,690,268

SHEET CONVEY APPARATUS

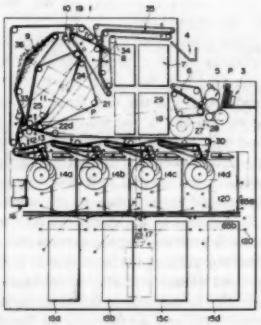
Akito Ueshin, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 555,542, Nov. 28, 1983, abandoned. This application May 16, 1986, Ser. No. 867,421

Claims priority, application Japan, Nov. 30, 1982, 57-209693

Int. Cl.[4] B65G *47/24*

U.S. Cl. 198—399 **10 Claims**



1. A sheet convey apparatus for conveying a mixture of obverse-and reverse-presented sheets, set at an inlet port, to collecting means, said sheets having a lengthwise direction, said apparatus comprising:

take-in means for taking in the sheets set at said inlet port, one at a time, and conveying said sheets in a direction perpendicular to said lengthwise direction;

sorting means for sorting the sheets taken in by said take-in means into a first group of obverse-presented sheets and a second group of reverse-presented sheets;

first conveying means for conveying the obverse-presented sheets which were sorted into the first group by said sorting means to a trailing end of said first conveying means and for conveying said sheets in said direction perpendicular to said lengthwise direction;

second conveying means for reversing the reverse-presented sheets which were sorted into the second group by said sorting means and conveying the obverse-presented sheets thus reversed to a trailing end of said second conveying means, said trailing ends of said first and second conveying means being arranged so as to merge, and for conveying said sheets in said direction perpendicular to said lengthwise direction, said second conveying means including:

a twisted convey path having an inlet port region and an outlet port region, said twisted convey path being arranged so as to clamp the sheets fed from said inlet port region and convey them to said outlet port region, while turning the sheets 180°, said twisted convey path being defined by the mutually opposing surfaces of a belt, one end of which is twisted by 720° with respect to the other end thereof and is coupled to the other end to form an endless belt, said endless belt being looped in a substantially 8-shaped manner so that portions of said endless belt are brought into surface contact at an intersection and are twisted in the same direction by 180°, about an axis perpendicular to a longitudinal direction of said endless belt, while being driven, said endless belt having a width narrower than a length of the sheet along the longitudinal direction; and

twisted guide means disposed at both sides of said twisted convey path and therealong, for supporting the two ends of the sheet being twisted and conveyed, said twisted guide means including first and second guide members which extend along both edges of said twisted endless belt, the first guide member having inlet and outlet portions, the inlet portion being in contact with one surface of one end portion of the sheet and the outlet portion being in contact with the other surface of one end portion of the sheet, the second guide member having inlet and outlet portions, the inlet portion being in contact with the other surface of the other end portion of the sheet and the outlet portion being in contact with one surface of the other end portion of the sheet, so that the sheet is turned by the twisted convey path and the twisted guide means; and

third conveying means for conveying merged obverse-presented sheets to said collecting means and for conveying said said sheets in a direction perpendicular to said lengthwise direction.

4,690,269

APPARATUS FOR TRANSFERRING SHAPED ARTICLES

Kenji Takao, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Filed Jan. 31, 1986, Ser. No. 824,885

Claims priority, application Japan, Feb. 1, 1985, 60-16598

Int. Cl.[4] A21C *9/08*; B65G *23/00*

U.S. Cl. 198—460 **1 Claim**

1. An apparatus for transferring shaped articles comprising:

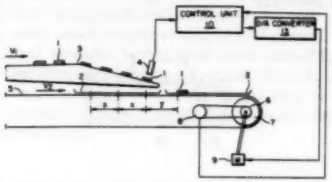
a first conveyor for conveying shaped articles at a constant speed;

a detecting unit disposed at a predetemined position above

the first conveyor so as to detect the shaped articles being conveyed on the first conveyor;

a second conveyor for conveying at a variable speed trays spaced apart a predetermined distance from each other, the second conveyor being disposed beneath and opposite to the delivery end of the first conveyor;

a rotary encoder coupled to the second conveyor; and



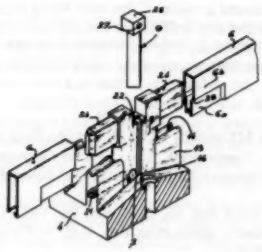
a control means which receives information from the detecting unit, information from the rotary encoder, and information concerning the positions of the shaped articles to be placed on the trays, the control means controlling the speed of the second conveyor on the basis of the above three kinds of information, whereby the shaped articles are automatically transferred onto the trays in a relation spaced apart a predetermined distance from each other.

4,690,270

RAIL-TUBE HOLDER FOR WALKING-BEAM CONVEYOR

Robert Braymand, Villefranche Sur Saone, France, assignor to Societe Nouvelle Baele Gangloff, Vennissieux, France

Filed Jul. 7, 1986, Ser. No. 882,276
Claims priority, application France, Jul. 5, 1985, 85 10765
Int. Cl.[4] B65G *25/00*
U.S. Cl. 198—774 **13 Claims**



1. In a walking-beam conveyor having a plurality of beams each formed of a longitudinal row of longitudinally extending and aligned tubes connected together at holders, the improvement wherein each holder comprises:

a stationary base formed with an upwardly open hole and provided above the hole with a projection extending longitudinally in one direction and fitting complementarily with one of the ends of one of the tubes;

a holder element having an upright shaft engageable snugly in the hole and formed with a projection extending longitudinally in a direction opposite to the base projection and normally fitting complementarily with one of the ends of another of the tubes;

a locking member engageable longitudinally between the hole and the holder element and pressing the holder element longitudinally in the opposite direction against a face of the hole; and

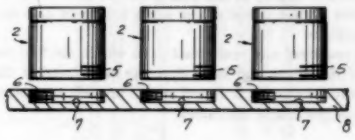
vertically overlapping formations on the element and on the face of the hole preventing upward movement of the element in the hole when the element is pressed against the face by the locking member.

4,690,271

TRAVEL CASE WITH SCREW-IN CONTAINERS

Deborah K. Zak, 130A S. State St., Apt. C, Newtown, Pa. 18940

Filed Sep. 20, 1982, Ser. No. 419,965
Int. Cl.[4] B05C *17/00*; B65D *21/00*
U.S. Cl. 200—1.7 **5 Claims**



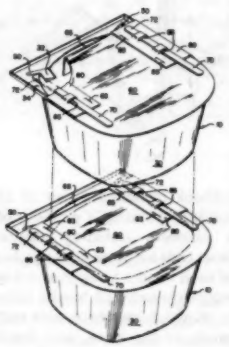
1. An enclosed travel case comprising a substantially rigid bottom wall, at least one covered round container which fits within said case and has screw threads on its lower extremity, and a mating threaded element integral with said bottom wall on the inside of said case, whereby said container may be screwed to the threaded element in the bottom wall of said case.

4,690,272

CONTAINER DISPLAY

William E. Adams, Portersville, Pa., assignor to Adams Mfg., Portersville, Pa.

Continuation-in-part of Ser. No. 714,975, Mar. 22, 1985, abandoned. This application Aug. 18, 1986, Ser. No. 884,476
Int. Cl.[4] B65D *51/00*
U.S. Cl. 206—45.28 **13 Claims**



1. A container for shipping, storing and displaying goods comprising:

(a) a bottom including a base portion upwardly depending wall portion forming a dish-like structure having an open top, the wall portion having at least one slot sized and positioned to receive and support a strut, and a rim on the upper portion of the wall portion.

(b) a lightweight cover made from a material selected from the group comprising lightweight cardboard, card stock and paper which is at least 90 pound weight, divided into a first portion and a second portion by a fold line across the cover, the first portion sized to cover the open top and to extend over at least part of the rim, and the second portion sized for attachment to the wall portion of the

base, the second portion of which is attached to the wall portion of the base in a manner allowing the cover to be folded along the fold line to a closed position closing the container with the cover resting on at least part of the rim, and raised to an open portion in which the first portion of the cover and the second portion of the cover are in the same plane;

(c) at least one rigid support strut having one end sized to be received by the slot, said strut movably attached to the cover in a manner so that the strut is

(i) substantially perpendicular to the fold line,

(ii) able to be moved into engagement with the slot and the first portion of the cover when the cover is in an open position

(iii) and sized and positioned to be within the first portion of the cover and have opposite ends overlap the rim when the cover is closed and to provide support to the first portion of the cover.

4,690,273

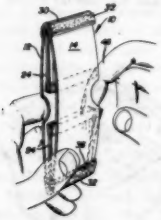
TWIN MATCHBOOK

Leon E. Smith, 740 Ranch Dr., Toledo, Ohio 43607

Filed Feb. 26, 1986, Ser. No. 833,186

Int. Cl.[4] A24F *27/00*

U.S. Cl. 206—105 **7 Claims**



1. A twin matchbook including a pair of axially aligned match bundles each incorporating a plurality of side-by-side elongated match members including chemically treated scratch ignitable head ends and base ends, the base ends of the match members of each bundle being removably jointed to a corresponding binder strip and each bundle including side-by-side parallel rows of match members with said binder strip extending transversely of the rows, said bundles being arranged in spaced relation with the head ends of the bundles axially opposing each other and the base ends of bundles facing in opposite directions, first and second substantially straight elongated panel means extending lengthwise between said bundles and interconnecting pairs of corresponding opposite ends of said binder strips, said panel means extending along and overlying opposite sides of said bundles with said bundles sandwiched between said panel means, the head ends of the match members of said bundles being spaced apart sufficiently to enable said binder strips and bundles to be displaced toward each other sufficient to allow the longitudinal mid-portions of said panel means to be appreciably bowed apart for the reception of a user's finger between said bowed apart panel mid-portions while the match heads of the bundles are still spaced apart.

4,690,274

CONTAINER FOR ELECTRONIC COMPONENTS

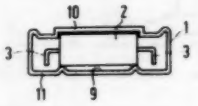
Hsueh C. Lue, Kaohsiung, Taiwan, assignor to U.S. Philips Corp., New York, N.Y.

Filed Dec. 2, 1985, Ser. No. 803,356

Claims priority, application Netherlands, May 15, 1985, 8501400

Int. Cl.[4] B65D *85/30*

U.S. Cl. 206—328 **10 Claims**



1. A container for generally flat, rectangular electronic components, said container comprising:

a tubular housing having a cross-section with an inside height and an inside width, the width exceeding the height, said tubular housing having top and bottom walls defining the height and side walls defining the width, said tubular housing having an end, said top wall having a recess therein spaced from the end of the tubular housing, said tubular housing being made of a synthetic elastic material; and

a closure member arranged in the end of the tubular housing, said closure member being in the form of a key having a handle and a shaft, the shaft extending from the handle into the tubular housing, the shaft having a thickened portion spaced from the handle a distance equal to the spacing of the recess from the end of the tubular housing, said thickened portion having a cross-section with a height and width, the height of the thickened portion of the shaft being larger than the inside height of the tubular housing, the width of the thickened portion of the shaft being substantially equal to the inside height of the tubular housing, said shaft being rotatable in the tubular housing, said thickened portion of the shaft being engageable in the recess in the top wall of the tubular housing, said handle being substantially aligned with the tubular housing when the thickened portion of the shaft engages the recess.

4,690,275

CARRIER MEMBER FOR INTEGRATED MODULES

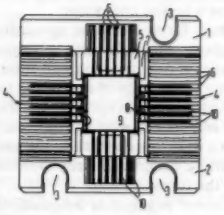
Otmar Fritz, Neukeferloh, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 16, 1986, Ser. No. 907,793

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1985, 8527387[U]

Int. Cl.[4] B65D *73/02*

U.S. Cl. 206—331 **2 Claims**



1. A carrier member for integrated circuit modules, comprising:

two parallel flanges each having at least one outwardly open groove for accepting a retaining pin;

two connecting webs extending between said two parallel flanges to form a rectangular frame around a central recess;

a plurality of parallel extending guide channels for accepting lead wires extending laterally from the integrated circuit module and provided in each of said flanges and said connecting webs, at least twice as many of said guide channels in said connecting webs as in said flanges;

retaining webs arranged in said central recess; and

retaining catch tabs arranged in said central recess;

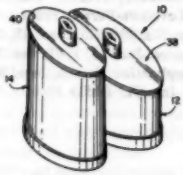
whereby circuit modules having lead wires extending only from two opposite sides occupy all guide channels of said connecting webs, and circuit modules having lead wires extending in identical numbers from all four sides are insertable into said central recess.

4,690,276

CONTAINERS FOR COSMETIC SUNDRIES

Howard Sussman, 3101 NW. 25th Ave., Pompano Beach, Fla. 33069

Filed Sep. 5, 1986, Ser. No. 904,030
Int. Cl.[4] B65D *83/02, 21/02*
U.S. Cl. 206—36 X **7 Claims**



1. A container for cosmetic sundries having two integrally connected sections, each adapted to hold a particular class of sundry articles, each section comprising a vertically oriented sleeve having an open top and a removable lid, one of said sleeves having a relatively fixed bottom wall and the other one of said sleeves having a bottom tray movable within said other sleeve and an articulating connection between said bottom tray and the associated lid to present the articles held in said other sleeve above the top thereof, said articulating connection comprising a flat bar having a trunion at each end and said tray and lid have clevis means for pivotaly receiving said trunion, said tray and lid being relatively movable with respect to said bar and to each other.

4,690,277

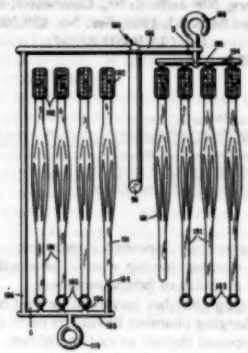
PREPACKAGED FUSED SYNTHETIC BRUSHES

John C. Lewis, Jr., Salisbury, Vt., assignor to Tucel Industries, Inc., Forest Dale, Vt.

Continuation-in-part of Ser. No. 709,667, Mar. 8, 1985, Pat. No. 4,619,485. This application Jul. 14, 1986, Ser. No. 884,941
Int. Cl.[4] A46B *9/04, 15/00*; A46D *3/04*; B65D *69/00*
U.S. Cl. 206—362.1 **11 Claims**

1. An improved brush package comprising:

a plurality of brushes, each brush consisting of a plastic brush back and a plurality of synthetic cut-to-length filament tufts fused thereonto; an integral plastic runner forming a frame, and severable gates interconnecting each of said brush backs at an end thereof to said runner whereby said brush backs, runner and gates may be simultaneously molded for subsequent tufting; and an integral



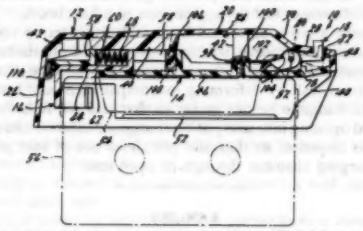
hook means mounted on said runner for displaying said package.

4,690,278

CASSETTE TAPE HOLDER

Yuki Uchiyama, Tokyo, Japan, assignor to Sakai & Co., Ltd., Japan

Continuation of Ser. No. 735,325, May 17, 1985, abandoned. This application Jun. 16, 1986, Ser. No. 874,889
Claims priority, application Japan, May 18, 1984, 59-072947[U]; May 18, 1984, 59-020119
Int. Cl.[4] A47B *81/06*
U.S. Cl. 206—387 **11 Claims**



1. A cassette tape holder comprising:

a housing;

a frame secured within said housing, said frame including means defining a plurality of elongated channels in side by side relationship, each of said channels being sized to receive a cassette tape, said defining means including means engageable with said cassette to support same;

grasping means associated with each of said channels and movably supported on said frame, each of said grasping means including opposed arm members positioned within said channel and operative to frictionally grasp opposite lateral edges of said cassette; and

releasable latching means associated with each of said channels and supported on said frame, said releasable latching means including a portion projecting into said channel and engageable with said cassette to lock said cassette within said channel;

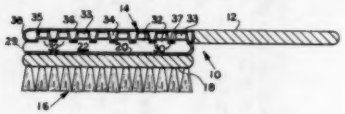
said grasping means being operative to inhibit ejection of said cassette from said channel upon release of said latching means.

4,690,279

BIRTH CONTROL PILL DISPENSER IN THE FORM OF A HAIR BRUSH

Charles Hochberg, 508 Jeffords St., Clearwater, Fla. 33516

Filed Mar. 13, 1986, Ser. No. 839,202
Int. Cl.[4] B65D *83/04*
U.S. Cl. 206—531 6 Claims



1. A birth control pill dispenser, comprising:
a hair brush member having a solid base within which is mounted a plurality of bristle members;
a pill-discharging chamber surmounting said base;
said pill-discharging chamber having an open end for allowing pills disposed therein to exit therefrom;
said pill-discharging chamber having a top wall with a plurality of pill-sized openings formed therein;
a pill storage chamber surmounting said pill-discharging chamber;
said top wall of said pill-discharging chamber forming the bottom wall of said pill storage chamber;
a supply of birth control pills positioned in said pill storage chamber;
a frangible barrier means positioned in overlying relation to said bottom wall of said pill storage chamber;
said barrier means including a plurality of deformable pill-containing compartments, each of said compartments being positioned in registration with an associated pill-sized opening formed in said pill storage chamber bottom wall;
a pill positioned in each of said compartments;
and masking means operable to close said pill storage chamber so that when said pill storage chamber is closed, said pill dispenser has the appearance of a hair brush;
whereby a pill is dispensed from said dispenser by opening said masking means, pushing a preselected pill through its associated opening formed in said pill storage chamber bottom wall by deforming its compartment and breaking said frangible barrier means so that said pill falls through said opening into said pill-discharging chamber, and tilting said dispenser so that said pill slides out of said pill-discharging chamber through its open end.

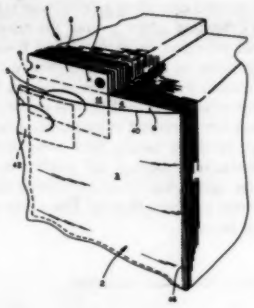
4,690,280

DETACHABLE PLASTIC BAG PAD AND PROCESS FOR MAKING SAME

Armin Meyer, Cologne, Fed. Rep. of Germany, assignor to Lemo M. Lehmacher & Sohn GmbH Maschinenfabrik, Niederkassel-Mondorf, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,872
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424748
Int. Cl.[4] B65D *1/34, 6/04*
U.S. Cl. 206—554 12 Claims

1. In a stack of interlocked detachable bags, each of said bags being formed from a thermoplastic foil strip and comprising two walls, a front wall and a back wall, at least one handle-shaped incision positioned on one of said walls adjacent on upper filling opening, wherein said bags are attached together with the aid of at leat one interlock means engaging an interlock piece and by means of a row of perforations are detachable from said interlocked stack by tearing off, the improvement wherein on one of said walls which form an upper filling opening edge a reinforcing piece of plastic foil with said interlock piece connected thereto is attached adjacent said handle-shaped incisions, said reinforcing piece is attached so that said interlock piece protrudes above said upper filling opening edge, said interlock piece having said row of said perforations, said bags being detachable from said stack by tearing along



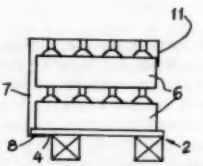
said row of said perforations, and said interlock means is formed in said interlock piece of said bags.

4,690,281

ASSEMBLY FOR STORING, TRANSPORTING AND DISTRIBUTING OBJECTS OF THE BOTTLE, FLASK OR SIMILAR TYPES AND PROCESS FOR MANUFACTURING SAME

Maurice Berthet, Coudoux, France, assignor to Compagnie Gervais Danone, Levallois-Perret, France

Continuation of Ser. No. 799,386, Nov. 18, 1985, abandoned.
This application Jan. 15, 1987, Ser. No. 6,301
Claims priority, application France, Nov. 16, 1984, 84 17503
Int. Cl.[4] B65D *19/00*
U.S. Cl. 206—597 6 Claims



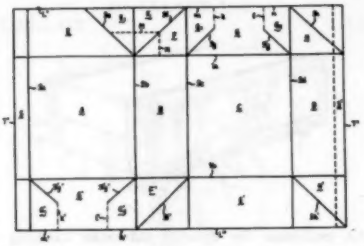
1. A packing and transport device for bottles, flasks, and jars as articles to be held thereon, comprising a first primary transport pallet with primary platform and two rows of primary support feet, at least two secondary pallets, said secondary pallets being placed side-by-side to define a junction interface between said articles on each said secondary pallet, each said secondary pallet comprising a secondary platform for receiving said articles, and each pallet having first and second rows of secondary support feet resting on the primary platform, said first row of secondary support feet being placed under the secondary platform and spaced inwardly from a first edge of said secondary platform opposite said junction interface to define along said first edge a free edge zone on said secondary platform, and a heat shrinkable material film cover enveloping the whole of said articles for holdin -aid articles in position on the secondary pallets, said cover being fixed to said secondary pallets on the free edge zones of their respective secondary platforms, said heat shrinkable film further comprising, for holding said articles in position on each of said secondary pallets, individual folded holding zones disposed substantially along the function interface which, when said cover is slit along the length of said junction interface and said secondary pallets separated, form tongues which hold said articles on each said respective secondary pallet.

4,690,282

BLANK FOR PARALLELEPIPED DISPENSING CARTON

Mario Ghini, Cassino, Italy, assignor to IN.GR.ED. Industrie Grafiche Editoriali S.p.A., Latina, Italy

Continuation-in-part of Ser. No. 535,955, Sep. 26, 1983, abandoned. This application Dec. 3, 1985, Ser. No. 804,035
Claims priority, application Italy, Sep. 28, 1982, 49177 A/82
Int. Cl.[4] B65D 5/74
U.S. Cl. 206—626 3 Claims



1. A rectangular semifinished sheet for manufacturing parallelepiped boxes for solid and fluid substances, having an upper and a lower longitudinal folding line and first, second, third and fourth transverse folding lines which, respectively, subdivide the sheet into a marginal transverse sealing zone, first, second, third and fourth side wall areas and first, second, third and fourth top and bottom wall areas, wherein:

said second top wall area has a quadrate shape and a diagonal folding line starting from the intersection point of said upper longitudinal folding line with said second transverse folding line between said first and second top wall areas and ending at the intersection point of the upper sheet edge with said third transverse folding line between said second and third top wall areas;

said first top wall area has a rectangular shape and an oblique folding line forming a right angle with said diagonal folding line; a first line of weakness extending from said oblique folding line to said diagonal folding line at an intermediate position between said upper sheet edge and said upper longitudinal folding line and parallel thereto and a second line of weakness extending from the intersection point of said first line of weakness with said diagonal folding line to said upper longitudinal folding line perpendicularly thereto;

said third top wall area having a first oblique partial folding line extending parallel to said diagonal folding line from the intersection point of said upper longitudinal folding line with said third transverse folding line, a second oblique folding line symmetrical to said first oblique folding line and first and second cut lines starting parallel to one another from the upper edge of the sheet and ending at the intersection point with said first and second oblique folding lines, respectively;

said first bottom wall area having folding and cut lines identical to those of said third top wall area, said second and fourth bottom wall areas having diagonal folding lines identical to those of said second and fourth top wall areas, no folding lines being provided on said third bottom wall area.

4,690,283

PARCEL SORTING APPARATUS

Ross M. Carrell, Burlington County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 26, 1985, Ser. No. 813,571
Int. Cl.[4] B07C 5/36; B65G 43/08
U.S. Cl. 209—549 18 Claims

10. A system for sorting and distributing articles, said articles having destination information thereon, said system comprising:

means for conveying said articles to a work station;

a plurality of distribution stations; and

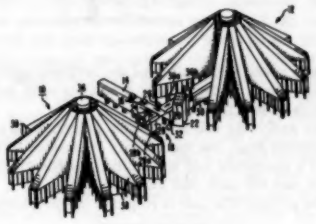
means at said work station responsive to said destination information for selectively conveying said articles to said distribution stations, wherein each of said distribution stations comprises:

an array of inclined chute sets, each chute set comprising

a plurality of inclined chutes, open at their upper and lower ends, said chutes arranged so that the aggregate of their upper ends forms a generally cylindrical surface having a substantially vertical central axis and their lower ends are disposed outwardly of said cylindrical surface forming radially spaced rows of axially directed openings;

a plurality of receptacles, each one positioned adjacent the lower end of a respective one of said chutes, such that an article exiting the lower end of one of said chutes will drop into one of said receptacles;

a rotatable mast having a longitudinal central axis aligned



substantially with the central axis of said cylindrical surface;

a carrier on said mast;

carrier motion means for producing pivotal motion of said carrier between a first position and a second position, said first position being such that said carrier retains an article therein, said second position of said carrier causing an article carried therein to spill radially outward of said central axis of said mast into the upper end of one of said chutes;

loading means for loading said articles into said carrier when said carrier is in said first position;

mast motion means for producing rotary motion of said mast about its central axis;

elevating means for elevating and lowering said carrier on said mast; and

control means for controlling said carrier motion means, said mast motion means and said elevating means, so that an article which has been loaded into said carrier by said loading means may be conveyed to a predetermined one of said plurality of receptacles.

4,690,284

METHOD OF AND APPARATUS FOR INSPECTING OBJECTS USING MULTIPLE POSITION DETECTORS

B. Shawn Buckley; Roy H. Reichwein; Edward M. Buckley, all of San Jose, and James A. Pinyan, Sunnyvale, all of Calif., assignors to Cochlea Corporation, San Jose, Calif.

Filed Oct. 4, 1985, Ser. No. 784,009
Int. Cl.[4] B07C 5/344
U.S. Cl. 209—590 17 Claims

1. Apparatus for parts sorting, that comprises:

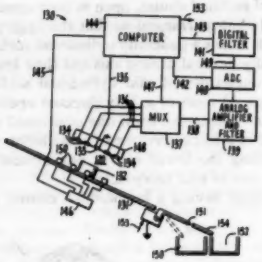
parts transport means to transport a part into an interaction region;

means for transmitting continuous wave energy of a single frequency into said interaction region where the wave energy interacts with said part;

detector means comprising a multiplicity of spaced-apart detectors for detecting the location of said part at a multi-

plicity of locations within said interaction region and adapted to provide a feedback signal indicative of each said location;

sensor means comprising a multiplicity of spaced-apart sensors disposed to receive said wave energy at a multiplicity of places after interaction with the part and to provide electrical signals representative of at least one of amplitude and phase information of the received wave energy for each sensor of said sensor means for each location on the basis of said feedback signal;



means for analyzing said at least one of amplitude and phase information from the multiplicity of sensors into at least one of a geometric and an electromagnetic characteristic of said part for each said location; and

means for sorting said part in response to said characteristic.

4,690,285

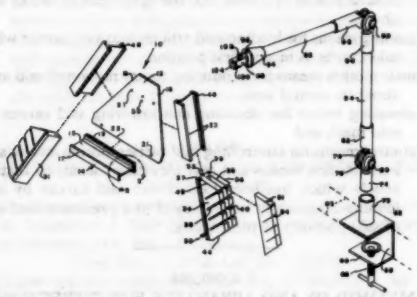
DISPENSING RECEPTACLE FOR DRAFTING EQUIPMENT

Earlyn W. Stone, 1109 Ridgecrest Cir., Costa Mesa, Calif. 92627

Filed Nov. 22, 1985, Ser. No. 800,828

Int. Cl.[4] A47G *19/08*

U.S. Cl. 211—41 **17 Claims**



1. A storage member to removeably receive flat, stiff items such as drafting tools and the like which comprises:

(a) a U-shaped frame having a base with opposite side-walls coextensive its side edges to form a single central, coextensive and longitudinal channel, and a plurality of cross slots extending laterally across said frame completely through each of said frame sidewalls to thereby guide or support said items during insertion or retraction from storage member; and

(b) an elastomeric retainer member received in said longitudinal channel of said U-shaped frame, substantially filling said channel between said sidewalls, with a like plurality of cross slits extending laterally across said member and aligned with said plurality of cross slots.

4,690,286

ENCLOSURE FOR HOUSING CIRCUIT BOARDS

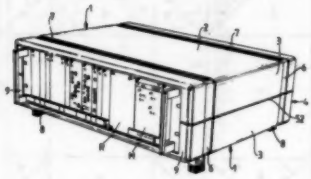
David Horne, Winchester, and Laurence Parker, West Wellow, both of England, assignors to BICC Public Limited Company, London, England

Filed Sep. 16, 1986, Ser. No. 907,972

Claims priority, application United Kingdom, Sep. 19, 1985, 8523161

Int. Cl.[4] H05K *5/00*

U.S. Cl. 211—41 **17 Claims**



1. An enclosure for housing sub-racks carrying circuit boards and modules carrying other electrical components, which enclosure comprises two separately formed substantially identical bodies, each of which constitutes an end wall and a part of each of a pair of oppositely disposed side walls and which are detachably secured together to form an enclosure having two oppositely disposed open faces, wherein, adjacent one of said two oppositely disposed open faces of the enclosure, the enclosure includes means on which sub-racks and modules can be detachably mounted in the enclosure in either of two positions, in one of which two positions front faces of the sub-racks and modules are substantially flush with said open face of the enclosure and in the other of which two positions said faces of the sub-racks and modules are set back from said open face of the enclosure.

4,690,287

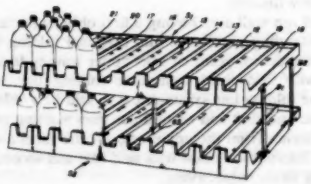
GRAVITY FEED DISPLAY DEVICE

Jane S. Fershko, Marietta, Ga., and Robert W. Lackey, Hickory, N.C., assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 557,851, Dec. 5, 1983, Pat. No. 4,593,823. This application Apr. 21, 1986, Ser. No. 853,938

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—49.1 **2 Claims**



1. A gravity feed shelf unit comprising a main chute structure including a pair of side walls and arranged to be inclined so as to feed articles in the direction of inclination thereof, a supplementary chute structure disposed alongside said main chute structure and including a slide plate and an outer side wall integral with said slide plate and spaced from one side wall of said main chute structure, one wall of said pair of side walls constituting an inner side wall of said supplementary chute structure, a front bumper, and a rear wall and similarly inclined so as to feed articles in the direction of inclination thereof, frangible means including a first frangible tab interconnecting said bumper and said one side wall of said main chute structure and a second frangible tab interconnecting said rear wall of said supplementary chute structure and said one side wall of said main chute structure, and a weakened severance

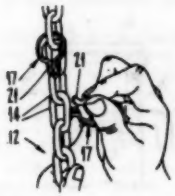
line interconnecting lower portions of said main and said supplemental chute structures and arranged to attach said supplementary chute structure to said main chute structure.

4,690,288

ARTICLE STORAGE AND DISPLAY DEVICE

Francoise E. L. Mitchell, South Melbourne, Australia, assignor to Tidy Chain Pty. Ltd., Prahran, Australia

Filed Feb. 18, 1986, Ser. No. 829,916
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—113 **4 Claims**



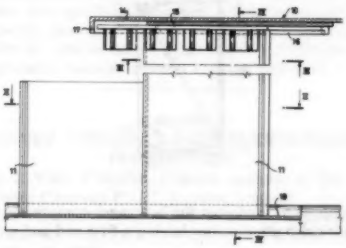
1. A storage or display device for maintaining a plurality of articles in a desired relationship comprising, in combination, a plurality of links of synthetic plastic material interconnected to form a chain having one or more strands, suspending means for suspending the chain from a support so that the chain hangs freely, substantially vertically, and a plurality of fastener means to be connected through a plurality of spaced links of the chain to be carried thereby, said fastener means having releasable gripping means to grip articles for support by the suspended chain.

4,690,289

SECTIONAL MODULAR ELEMENT DISPLAY UNIT

Franco Leolli, Magliaso Ticino, Switzerland, assignor to Modecor Italiana S.p.A., Varese, Italy

Filed Mar. 26, 1986, Ser. No. 844,130
Claims priority, application Italy, Apr. 12, 1985, 21429/85[U]
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—186 **3 Claims**



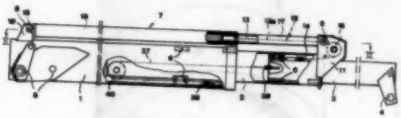
1. A display unit with variously combinable modular elements, comprising in combination: a plurality of vertically positioned plastic elongated sections of different lengths removably interlinked along their longitudinal edges by complementary jointing means to form a self-supporting structure, intermediate connection means removably mounted on upper ends of said sections and support surfaces removably mounted on said intermediate connection means, said elongated sections consisting of slightly curved section laths having complementary jointing means on either longitudinal edge, said jointing means being composed of an H-shaped portion and a slit hollow portion.

4,690,290

DEVICE OF THE KIND COMPRISING AT LEAST THREE MOVABLY CO-ORDINATED PARTS

Paul Gustafsson, Gavle, Sweden, assignor to AB Tico, Gavle, Sweden

PCT No. PCT/SE85/00243, § 371 Date Mar. 7, 1986, § 102(e) Date Mar. 7, 1986, PCT Pub. No. WO86/00607, PCT Pub. Date Jan. 30, 1986
PCT Filed Jun. 10, 1985, Ser. No. 845,261
Claims priority, application Sweden, Jul. 9, 1984, 8403618
Int. Cl.[4] B66C *23/06*
U.S. Cl. 212—267 **20 Claims**



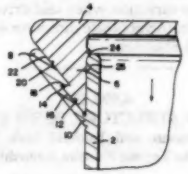
1. A device for providing relative movement between at least three movably co-ordinated parts (1, 2, 3), comprising: first, second and third co-ordinated parts, power means (7) at least partly arranged externally of the parts, said power means (7) being variable in length and acting between a point (8) on a first (1) and a point (9) on a second (2) of the parts, and at least one partly flexible traction element (12) extending between a point (14) on the third part (3) and a point (15) fixed in relation to the first part (1) and being arranged to cause relative movement between the third part (3) and said first and second parts (1, 2) by transmitting forces between the first and the third parts when relative movement between the first and second parts (1, 2) is effected by the power means, said traction element (12) having a portion (12*a*) located externally of the parts when the parts are extended relative to each other, characterized in that said portion (12*a*) of the traction element (12) located externally of the parts (1, 2, 3) is received in a longitudinal internal passage (13) in the power means (7), which thereby acts as a casing which is variable in length for said portion (12*a*) of the traction element (12).

4,690,291

BARBED LID CLOSURE

Alan H. Grant, 3208 Woodhollow Dr., Chevy Chase, Md. 20015

Filed Apr. 1, 1986, Ser. No. 846,802
Int. Cl.[4] B65D *41/16*
U.S. Cl. 215—32 **11 Claims**



1. A closure for a container comprising neck means for allowing passage of material therethrough, removable cap means for sealing said neck means, and removable retaining means for holding said cap means to said neck means, said cap means comprising an annulus having a first surface and a second surface contiguous and transverse to said first surface to form a ledge, said removable retaining means comprising a third surface extending generally parallel to said first surface and a fourth surface extending generally parallel to said second surface, said removable retaining means being connected to said neck means by frangible means, wherein said second and fourth surfaces engage to hold said cap means to said neck means and said first and third surfaces engage when said cap

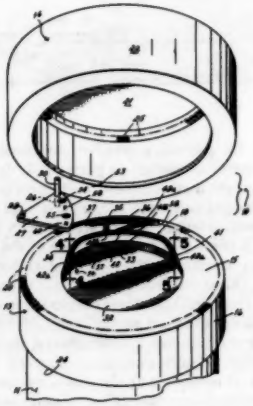
means is moved with respect to said neck means in a first direction transverse to said first and third surfaces to break said frangible means.

4,690,292

SAFETY CLOSURE

John C. Henning, Fairfield, Ohio, assignor to Product Investment Incorporated, Cincinnati, Ohio

Filed Jun. 20, 1986, Ser. No. 876,930
Int. Cl.[4] B65D *55/00*
U.S. Cl. 215—201 **17 Claims**



1. A safety closure for a threaded container adapted to store a potentially harmful substance, said closure comprising an inner cap having internal threads for engagement with the threads of said container, an outer cap substantially enclosing said inner cap and being rotatably supported thereby, a driving lug, means carried by said outer cap for supporting said driving lug for radial movement relative to said outer cap, groove means on said inner cap receiving said driving lug said groove means comprising an inner circular section, a first radial section, an intermediate arcuate section, said first radial section extending between said inner circular section and said intermediate arcuate section, a second radial section, an outer arcuate section having first and second abutments, said second radial section extending between said intermediate section and said outer arcuate section, said outer cap being effective to rotate said inner cap in one direction when said drive lug engages said first abutment and in the opposite direction when the drive lug engages the second abutment.

4,690,293

FILLER CAP STRUCTURE FOR A FUEL TANK

Kouji Uranishi, Susono, and Takaaki Itoh, Mishima, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 28, 1986, Ser. No. 856,358
Claims priority, application Japan, Jul. 17, 1985, 60-156126; Jul. 17, 1985, 60-156127
Int. Cl.[4] B65B *31/00*; B65D *41/04*
U.S. Cl. 220—86 R **6 Claims**

1. A filler cap structure for a fuel tank, comprising:

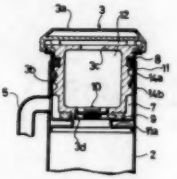
a filler cap having a plug member with upper and lower end and adapted to be fitted into a filler tube of a fuel tank;

an annular seal member provided on the inner peripheral surface of the filler tube at a location inward of the bottom end of the filler cap, the annular seat member including a seal seat adapted to be placed in intimate abutting engagement with the bottom end of the filler cap;

an annular space defined by the annular seal member, the inner peripheral surface of the filler tube, and the bottom portion of the filler cap;

a communication tube connected at its one end with the filler tube and at its other end with a canister for communicating the annular space with the canister for absorption of the fuel vapor introduced into the latter from the fuel tank;

a first annular seal member mounted on said upper end of said plug member disposed between an upper inner peripheral surface of the filler tube and the filler cap at a location outward of the annular space for sealing the fuel vapor from the ambient atmosphere; and



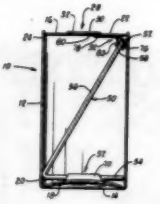
a second annular seal member mounted on said bottom end of said plug member and adapted to be placed, upon complete closure of the filler cap against the filler tube, in sealing engagement with the annular seal seat on the inner peripheral surface of the filler tube for sealing of the fuel vapor in the fuel tank, the first annular seal member engaging an upper portion of said annular seal member second seal member being disengaged from the annular seal seat so as to place the fuel tank in communication with the canister when the filler cap is partially loosened.

4,690,294

BEVERAGE CONTAINER

Robert D. Jones, 201 S. Creekdale Dr., #908, Norman, Okla. 73069

Filed Sep. 3, 1985, Ser. No. 771,620
Int. Cl.[4] A47G *19/22*
U.S. Cl. 220—90.2 **2 Claims**



1. An improved container for beverages comprising:

a cylindrical body member having a first end and a second end;

a substantially laterally disposed first disk sealingly connected to one of the first and second ends of the cylindrical body;

a substantially laterally disposed second disk sealingly connected to the other of the first and second ends of the cylindrical body member, the second disk having a pour opening formed therein;

closure strip means supported by the second disk for sealingly closing the pour opening, the closure strip means manually separable from at least a portion of the disk so as to permit access to contents within the container via the pour opening, said closure strip means comprising:

a closure strip and a pull ring supported by the closure

strip, the closure strip being defined by a scored line for retaining the closure strip to the second disk with a force greater than the force generated by pressure of the beverage contained in the container, the closure strip further characterized as having an underside facing the contents of the container when retained by the scored line, the pull-ring being pivotally connected to the second disk such that upon application of an upwardly directed force on the pull-ring one end portion of the pull-ring engages the closure strip and directs at least a portion of the closure strip in a downwardly direction so as to separate same along the scored line and cause the closure strip to be moved inwardly into the container so as to substantially unrestrict the pour opening;

a flexible tubular member disposed within the container so as to be flexible through the pour opening when the closure strip means is separated from the second disk, the flexible tubular member having a first end portion, a second end portion, and an extendible length greater than the length of the cylindrical body; and

stabilizing and aligning means for stabilizing the flexible tubular member within the container and for aligning the flexible tubular member with the pour opening such that upon removal of the closure strip means one end portion of the flexible tubular member is extendible through the pour opening, said stabilizing and aligning means comprising:

a pair of spatially disposed channel forming members supported by the first disk so as to be disposed within the container, the spatially disposed channel forming members defining a channel therebetween adapted to receive and stabilize the first end portion of the flexible tubular member in a position substantially adjacent the first disk;

a support member supported by the second disk and the adjacent end of the cylindrical body of the container so as to be substantially aligned with the pour opening, the support member supportingly engaging the second end portion of the flexible tubular member; and

a retainer member supported by the closure strip via the underside thereof, the support member and the retainer member cooperating to maintain the second end portion of the flexible tubular member in a biased position substantially adjacent the second disk such that upon disengaging the closure strip from at least a portion of the second disk the second end portion of the flexible tubular member is directed to the pour opening and extendible through the pour opening a sufficient distance to permit disengagement of the first end portion of the flexible tubular member from the channel formed by the spatially disposed channel forming members.

4,690,295

PRESSURE CONTAINER WITH THERMOPLASTIC FUSIBLE PLUG

Anthony J. Wills, Clevedon, England, assignor to The British Petroleum Company P.L.C., London, England

PCT No. PCT/GB84/00383, § 371 Date Jun. 10, 1985, § 102(e) Date Jun. 10, 1985, PCT Pub. No. WO85/02243, PCT Pub. Date May 23, 1985

PCT Filed Nov. 8, 1984, Ser. No. 744,819

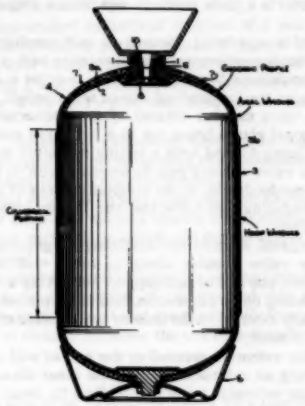
Claims priority, application United Kingdom, Nov. 9, 1983, 8329905

Int. Cl.[4] B65D *25/00*; F25J *00/00*

U.S. Cl. 220—207 **17 Claims**

1. A container for the storage and transportation of pressurised fluids and having a discharge opening, said container comprising:

a thermoplastic inner liner which opens into said discharge opening and which is stable and impervious to the fluid to be contained therein up to a predetermined temperature but is fluid-pervious above said temperature, a portion of said inner liner forming a fusible plug which is fluid-pervious above said temperature and which is exposed to the atmosphere when said discharge opening is closed and said container is subjected to at least said temperature and



an outer layer of an insulating fire resistant material encasing the inner liner but without covering said fusible plug so that above said temperature said fluid can pass through said plug to the atmosphere without passing through said outer layer.

4,690,296

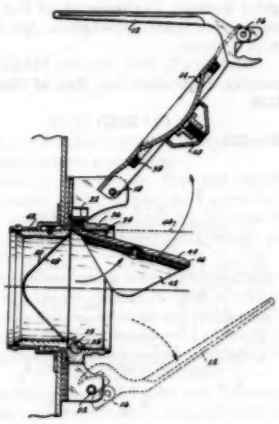
OPEN FLOW VALVE ASSEMBLY

Gregory K. Elliott, Tustin, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Oakland, Calif.

Continuation of Ser. No. 805,588, Dec. 9, 1985, abandoned, which is a continuation of Ser. No. 633,659, Jul. 23, 1984, abandoned. This application Oct. 17, 1986, Ser. No. 919,596

Int. Cl.[4] B65D *43/16*

U.S. Cl. 220—259 **9 Claims**



1. A valve assembly for sealing an aircraft lavatory drain port and adapted for full opening with no obstruction of flow, comprising:

a cylindrical conduit having an end on which a valve seat is formed;

a valve member made from a hollow cylindrical member

having an inner diameter which is the same as the inner diameter of said conduit, said inner valve member being formed from said hollow cylindrical member as a longitudinal portion thereof by cutting said hollow cylindrical member along two intersecting orthogonal planes whose bisector is a plane radial to said hollow cylindrical member;

said valve seat being formed on said conduit along two intersecting orthogonal planes entering said conduit at the circumference thereof and whose bisector is a plane that includes the longitudinal axis of said conduit, the apex of said valve member created by the intersection of its orthogonal planes being cut to a curvature and said valve seat being formed with a mating curvature whereby said inner valve member may be disposed with its longitudinal axis perpendicular to the longitudinal axis of said conduit for engaging said valve seat and thereby closing off said conduit;

an elongated support bar extending longitudinally of said inner valve member along its outer wall and secured thereto, one end of said support bar having a transversely extending hinge pin therein, said hinge pin being disposed radially external to the interior wall surface of one side of said conduit;

a tubular extension secured to the end of said conduit and forming an extension thereof, the inner diameter of said tubular extension being greater than the inner diameter of said conduit, said hinge pin being rotatably supported from said tubular extension such that said valve member may pivot through an angle of ninety degrees between its closed position, and a fully open position in which its interior wall surface is an extension of the interior wall surface of said conduit;

said tubular extension having external seating grooves adapted to receive a quick connect coupler; and

locking means carried by said tubular extension cooperating with the other end of said support bar for locking said valve member in its closed position.

4,690,297

OPENING MEANS FOR OBLONG CANS

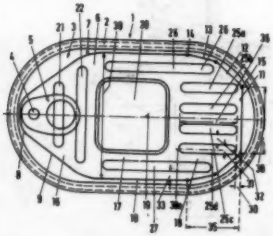
Peter Höft, Braunschweig; Wolfgang Peter, Cuxhaven; Johann Bergsteiner, Bremerhaven; Günter Berschick, Geversdorf; Wolfgang Drobe, Bremerhaven; Fritz Engelke, Cuxhaven; Heinz Hacke, Cuxhaven; Walter Hebbinghaus, Cuxhaven, and Siegfried Kuhnert, Cuxhaven, all of Fed. Rep. of Germany, assignors to Schmalbach-Lubeca AG, Braunschweig, Fed. Rep. of Germany

Filed Oct. 1, 1986, Ser. No. 914,114

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535226

Int. Cl.[4] B65D *17/34*

U.S. Cl. 220—273 **8 Claims**



1. A tin lid, in particular, of aluminum sheet, for out-of-round cans, in particular, cans of oblong shape in Hansa-format, comprising a tear-open portion which takes up almost the greatest part of the lid image section defined by the lid core wall, is enclosed by a self-contained recessed line having a starting portion in the area of one lid end and extending closely adjacent to the longitudinal sides and parallel to the lid edge, and, in the area near the starting portion, has secured thereto a lever-type pull-open ring so as to be in flat contact with the tear-open portion, the end of the pull-open ring extending in the longitudinal lid direction, and which is defined by a recessed line portion at the end of the lid remote from the starting portion, said recessed line portion extending in chordal-type fashon with respect to the arc-shaped extension of the core wall and having a length which equals almost half the greatest width of the tear-open portion spaced apart from the lid core wall—measured alaong the longitudinal lid center line at a distance between approximately 2 mm and 15 mm, and in the case of which lid, the tear-open portion is stiffened in various manners by means of a plurality of beads or the like which are oriented approximately transversely to the longitudinal center line in the starting area and, approximately parallel to the longitudinal center line, in the other areas, characterized in that over the entire width (**38**) of the chordal-type recessed line portion (**11**) the beads (**25**) extending substantially parallel to the longitudinal center line (**19**) are spaced from the chordal-type recessed line portion (**11**) at equal distances (**30**) of between approximately 1 mm and approximately 7 mm and the width (**31**) of the beads approximately equals the width of the undeformed area (**32**) intermediate adjacent beads (**25*a*–25*d***).

4,690,298

REMOTELY-HANDLED REPLACEABLE COMPONENT

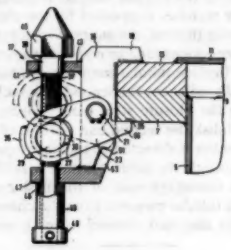
Erwin Schepers, Haltern, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 845,173

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512467

Int. Cl.[4] B65D *45/16*

U.S. Cl. 220—325 **5 Claims**



1. A remotely handled-replaceable component adapted for being removably mounted on a stationary component, the replaceable component being especially for use in a large-area processing cell for reprocessing irradiated nuclear fuel, the replaceable component comprising:

a body defining the replaceable component;

at least two locking devices mounted laterally on said body, each of said locking devices including:

a carrier mounted on said replaceable component;

locking lever means pivotally mounted on said carrier for moving between a first position whereat said locking lever means is disengaged from said stationary component and a second position whereat said locking lever means is engaged with said stationary component for locking said replaceable component thereto;

entrainment means for entraining said locking lever means; and,

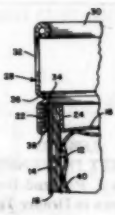
actuator means mounted on said carrier for displacing said entrainment means to pivotally drive said locking lever means between said positions.

4,690,299

BULK CARBONATED BEVERAGE CONTAINER

David C. Cannon, Darlington, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Jun. 17, 1986, Ser. No. 875,047
Int. Cl.[4] B65D *5/40*
U.S. Cl. 220—402 **1 Claim**



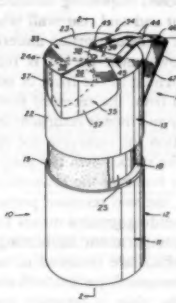
1. In a container for pressurized liquids a tubular composite body of sufficient structural integrity to independently accommodate pressurized liquids therein with minimal radial expansion, a similarly configured independent self-sustaining tubular metal wall surrounding said body, said tubular wall having an inside diameter greater than the outside diameter of said composite body and defining a continuous annular space therebetween sufficient for the accommodation of pressure-induced radial expansion of the composite body equally thereabout and independently of said tubular wall, the relationship between the defined annular space and the anticipated pressure-induced expansion of the composite body being such as to accommodate the expansion, up to intimate engagement with said tubular wall, without imposing a wall distorting pressure on said tubular wall, said composite body and said tubular wall having opposed ends with the ends of the composite body and the ends of the tubular wall being generally coextensive, and a pair of container end caps overlying the opposed ends of the composite body and peripherally joining the opposed ends of the tubular wall for an axial retention of said end caps, said end caps extending into the opposed ends of the composite body and being exposed to internal pressure within said container with the joining to the tubular wall and the tensile strength of the tubular wall being sufficient to resist said pressure.

4,690,300

INSULATED COOLER FOR BEVERAGE CONTAINERS

David E. Woods, 2647 Kodiak Ct., Houston, Tex. 77067

Filed Dec. 31, 1986, Ser. No. 947,990
Int. Cl.[4] B65D *25/34*
U.S. Cl. 220—412 **13 Claims**



1. An insulated enclosure for containers comprising in combination;

a lower cup-shaped cylindrical member adapted to receive a container containing a consumable product,

a lining in said lower cup-shaped cylindrical members extending beyond the open top thereof and of sufficient length to receive and completely enclose the length of a container of a consumable product

an upper cup-shaped cylindrical member of a size fitting around the extending portion of said lining and having a top wall with a lining closing against the top end of said first named lining to form a complete enclosure around a container when said cylindrical members are fitted together,

said upper cup-shaped cylindrical member having a top opening located over a top opening in a consumable product container when positioner therein,

closure means mounted on said upper member in position to open and close said opening therein and operable by the user of said enclosure to selectively expose said container opening, and

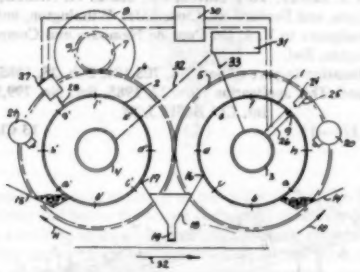
said upper member opening being of a size and shape when open to expose a portion of the top and side surfaces adjacent said opening of said container sufficient to allow the user to directly consume the contents therefrom.

4,690,301

APPARATUS FOR INDIVIDUALLY DEPOSITING ARTICLES

Leif Högberg, Solklintvej, Denmark, assignor to Jydsk Teknologisk Institut, Arhus, Denmark

Filed Feb. 6, 1986, Ser. No. 826,774
Claims priority, application Denmark, Feb. 22, 1985, 830/85
Int. Cl.[4] A01C *7/04*
U.S. Cl. 221—2 **3 Claims**



2. An apparatus for individually depositing seeds according to a predetermined pattern comprising:

rotatably mounted, side-by-side, first and supplementary hollow cylinders having intermeshed gears for effecting rotation of said cylinders in mutually opposite directions;

drive means engaging one of said gears for the rotation of said cylinders;

each of said cylinders having longitudinally extending rows of apertures of equal number in each of said rows, said rows in said cylinders, respectively, being equally spaced apart circumferentially and said rows of one of said cylinders corresponding to said rows of the other of said cylinders;

troughs respectively associated with said cylinders for supplying seeds to said apertures in said cylinders during the rotation;

sets of blowing nozzles respectively directed toward one of said rows of said cylinders for blowing all but one seed from said apertures of said rows, in succession during the rotation, said sets being respectively spaced from said troughs at locations in the directions of the rotation;

means for detecting the presence and absence of a seed in

any of said apertures of said rows in said first cylinder, said detecting means being spaced from said first cylinder set of nozzles at a location in the direction of the rotation;

stripping means including strippers for normally carrying out a removal of each of the seeds from said apertures in each of said rows, in succession, in said supplementary cylinder upon the rotation thereof, said stripping means being spaced from said supplementary cylinder set of nozzles at a location in the direction of the rotation, said stripping means and said detecting means being in registry relative to said cylinders;

means coupling said detecting means with said stripping means for lifting said strippers relative to said supplementary cylinder to cese the removal of seeds from said apertures in response to any absence of seeds from said apertures of said first cylinder as detected by said detecting means; and

an upright collecting box associated with both said cylinders and having a row of depositing pipe stubs corresponding to the number of said apertures in each said row, said box having a pair of scraping edges at the top thereof respectively contacting said cylinders for releasing the seeds from said apertures during the rotation;

whereby seeds are deposited in said collecting box from said apertures of said first cylinder during the rotation thereof, and only in the event of any absence of seeds from any of said apertures of said first cylinder, seeds are deposited in said box from said apertures of said supplementary cylinder, during the rotation thereof, corresponding to the empty apertures of said first cylinder.

4,690,302

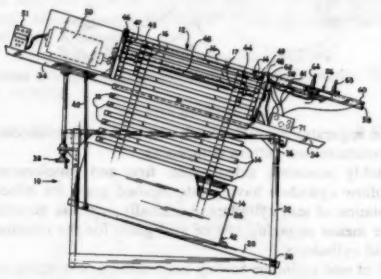
PACKAGE AND APPARATUS FOR DISPENSING ELECTRICAL CONNECTORS

Raymond S. Zebley, York Haven, Pa.; James H. Nichols, Jr., Hockessin, and Bernard M. Ciosek, Jr., Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 705,181, Feb. 25, 1985, abandoned. This application Nov. 22, 1985, Ser. No. 799,525

Int. Cl.[4] B65H *5/28*

U.S. Cl. 221—11 **13 Claims**



1. An apparatus for dispensing articles from elongated tubes secured to and arranged in spaced parallelism across a flexible tape, each tube having a closure at each end for holding articles therein, said apparatus comprising

a stand provided with upper and lower support members for the ends of the tubes,

a slide extending downwardly from the lower support member to a perch,

a stepping device for advancing successive tubes along said support members to the location of said slide, and

means on the lower support member for opening the closure at the lower end of each tube in its approach to the slide, said means having an opening device extending through said lower support member at the location of the tube to be opened.

4,690,303

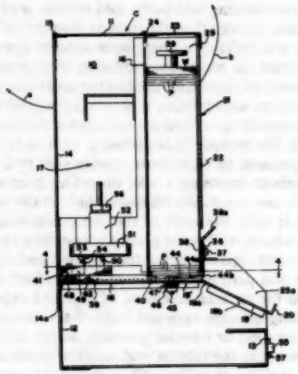
COUPON PACKET DISPENSING SYSTEM

Reed T. Draper; Kenneth J. Pol, and Dennis R. Martin, all of Saginaw, Mich., assignors to Draper Technologies, Inc., Saginaw, Mich.

Filed Sep. 23, 1985, Ser. No. 779,158

Int. Cl.[4] B65G *59/06*

U.S. Cl. 221—131 **13 Claims**



1. In a coupon packet dispenser or the like; housing means defining a vertically disposed compartment receiving a stack of substantially vertically aligned, vertically juxtaposed packets; said compartment having generally vertical front and rear walls; a forwardly and return movable regid floor plate underlying said compartment and having a flat surfaced, recessed portion extending rearwardly from its front end and defining a generally vertically disposed dispensing shoulder adjacent the rear of said compartment and said rear wall when the plate is in rearward position, the recessed portion underlying the compartment so that the lowermost packet is received in said recessed portion, and opening to the front of said plate so the packet can be separated from the recessed portion when the plate is moved forwardly and thence returned; the plate having a flat surfaced rear portion for receiving the next lowermost packet and supporting the stack when the plate is moved forwardly and the shoulder removes the lowermost packet from the bottom of the stack; the said recessed portion of the plate having front to rear extending groove means thereon and the said rear wall of the compartment supporting downwardly projecting tab means which are received in said grooves to prevent famming of a lowermost packet between the said rear wall and plate when the plate is returned rearwardly; and means attached to the housing means extending downwardly to restrain the next lowermost packet from moving forwardly when the plate is moved forwardly to push the lowermost packet forwardly.

4,690,304

OBTURATING DEVICE FOR TUBES, FLASKS AND OTHER CONTAINERS, THE OPENING AND CLOSING OF WHICH ARE CONTROLLED THROUGH ROTATION

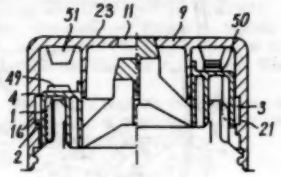
Simone Morel, 15 rue du Faubourg de Paris, 51210 Montmirail, France

Filed Dec. 5, 1985, Ser. No. 805,285

Claims priority, application France, Dec. 7, 1984, 84 18787; Mar. 6, 1985, 85 03292

Int. Cl.[4] B67D 5/22; B65D 47/30; G01F 11/32; B67B 7/48

U.S. Cl. 222—44 21 Claims



1. An obturating device for a tube, flask and like container having a neck with an inner edge and an outlet passage, wherein the obturating device comprises

a valve-cap and a casing; said valve-cap having a plate provided with an upper part;

a secondary component protruding at said upper part;

a set of maintaining blades protruding in middle of the outlet passage of the container in order to maintain in place said secondary component;

a fitting skirt for said neck, with said fitting skirt downwardly extending said plate of said valve-cap and comprising an outer periphery;

said valve-cap further having an inner cylindrical tightness skirt and a second tightness skirt, with said second tightness skirt being slightly tapered downwardly and applied against said inner edge of said neck;

said casing comprising a substantially plane upper plate having a central hole and an outer fitting skirt comprising an inner periphery;

said outer periphery of the fitting skirt of said valve-cap and said inner periphery of the outer fitting skirt of said casing having a complementary notch-ramp structure for an alternate reciprocating engagement and disengagement of said secondary component of said valve-cap into and from said hole of said substantially plane upper plate of said casing;

said casing having an inner part provided with a tightness skirt, said tightness skirt being slightly tapered downwardly and applied against said inner cylindrical tightness skirt of said valve-cap;

said upper part of the valve-cap being further provided with first fin means cooperating with second fin means mounted in the casing to prevent any rotation of the casing during transportation of the container, whereby opening and closing of the device are respectively made by a positive rotation of the casing in one and another direction with a suitable tightness in rotation being provided by said tightness skirts.

4,690,305

SOLID BLOCK CHEMICAL DISPENSER FOR CLEANING SYSTEMS

James L. Copeland, Burnsville, Minn., assignor to Ecolab Inc., St. Paul, Minn.

Filed Nov. 6, 1985, Ser. No. 796,017

Int. Cl.[4] B67D 5/00; B01D 11/02

U.S. Cl. 222—52 6 Claims

1. A means for dispensing a concentrated aqueous wash chemical solution from a solid block of a wash chemical to a utilization point, which comprises:

(a) a housing for the solid block of wash chemical, comprising:

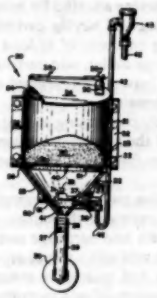
(i) an upper storage portion which can retain more than one solid block of wash chemical and which allows a downwardly facing surface of the lowermost solid block of wash chemical to remain in substantially continuous contact with a flat, horizontal screen support means; the upper storage portion defining a storage cavity and having an upwardly disposed access port with a cross-sectional area at least as large as the cross-sectional area of the storage cavity for allowing access to the storage cavity;

(ii) a door operatively engaged to the housing and positioned across the upwardly disposed access port, the door being movable with respect to the access port to open and close access to the storage cavity; and

(iii) a funnel shaped collector portion integral with and extending continuously downward from the storage portion and terminating at a lower outlet port from the housing;

(b) mounting means for mounting the housing onto a vertical support;

(c) the flat horizontal screen support means in contact with the housing for retainably supporting more than one solid block of wash chemical thereabove;



(d) spraying means mounted in the collector portion of the housing and below the screen supporting means for directing a uniform spray at substantially the entire downwardly facing surface of the lowermost solid block of wash chemical such that the concentrated aqueous wash chemical solution is formed by dissolution of substantially only the downwardly facing surface of the lowermost solid block of wash chemical;

(e) a wash chemical solution conduit connecting the outlet port with the utilization point for directing the concentrated wash chemical solution from the collector portion of the container to the utilization point;

(f) a water supply line connecting the spraying means with a pressurized source of water;

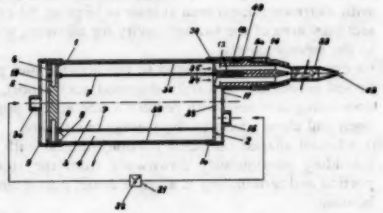
(g) spray control means cooperatively connected to the water supply line for selectively controlling the flow of water through the supply line and onto the spray means, the spray control means being operative in response to receipt of a control signal to open the water supply line to water flow therethrough, causing the spray means to direct a spray of water against substantially the entire downwardly facing surface of the solid block of wash chemical retainably supported immediately above the support screen, dissolving that wash chemical contacted with water which then passes in solution through the support screen to the underlying collector portion of the container, through the outlet port, to the conduit and onto the utilization point.

4,690,306

DISPENSING DEVICE FOR STORING AND APPLYING AT LEAST ONE LIQUID OR PASTY SUBSTANCE

Theodor Stäbeli, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 1, 1986, Ser. No. 891,826
Claims priority, application Switzerland, Aug. 12, 1985, 3456/85; Jan. 17, 1986, 193/86
Int. Cl.[4] B67D 5/42
U.S. Cl. 222—80 26 Claims



1. A dispensing device for storing and applying at least one liquid or pasty substance, which device comprises

a housing;

a dispensing nozzle attached thereto;

at least one cartridge adapted for being lodged in the interior of said housing and having cartridge wall means adapted for enclosing contents of at least one substance therein, and a discharge outlet; said cartridge being longitudinally displaceable between a rearward and a forward end position in said housing;

a piston assembly comprising at least one piston for expelling a quantity of the aforesaid substance from said cartridge;

mounting means for said at least one cartridge in said housing;

at least one valve means for controlling dispensing of contents of said cartridge therefrom; said valve means being associated with said cartridge and said housing in a manner such that said valve means are closed in said rearward end position, and said valve means are open in said forward end position of said cartridge;

means for displacing said cartridge and said piston assembly in a forward direction; and

restoring means for returning said cartridge from a forward position to said rearward end position thereof.

4,690,307

DISPENSING SYSTEM WITH SLIDABLE MODULES

Lawrence R. Hogan, Lake Villa, Ill., assignor to Cole-Parmer Instrument Company, Chicago, Ill.

Continuation-in-part of Ser. No. 427,504, Sep. 29, 1982, Pat. No. 4,513,885, which is a continuation of Ser. No. 35,817, May 4, 1979, abandoned. This application Feb. 13, 1984, Ser. No. 579,381
Int. Cl.[4] F04B 43/12
U.S. Cl. 222—95 8 Claims

1. A dispenser system for a plurality of flowable products, said system comprising:

a housing having an upper body having side walls, a top wall and a bottom wall defining a hollow compartment with an open front face,

a plurality of dispenser modules for sliding rearwardly through the open front face of the module,

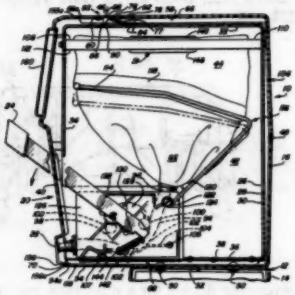
each of the modules having an internal flexible bag of flowable product and peristaltic pump therein for discharging flowable product at a lower front end of the module,

an open side on each of said modules providing access for installation and replacement of a flexible bag within the module,

operating means on the front of each module to operate the peristaltic pump to dispense a portion of the flowable product,

guide surfaces on the modules and housing to guide each of the modules for rearward sliding movement into positions parallel with each other within the housing,

latching means extending between each of the modules and the housing to latch each module in position in the housing, and



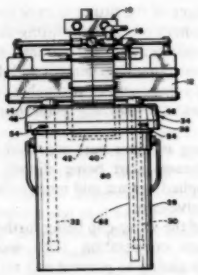
a front section having a front wall on each module, said front section having a top wall and a pair of sidewalls extending rearwardly from the front wall and joined thereto, the outer wide walls on said modules being aligned with the side walls on the housing and top walls on said modules being aligned with the top wall on the housing.

4,690,308

PAIL MOUNT PUMP WITH INTEGRAL COVER

James E. Cavanaugh, Sunland; Larry Erwin, North Hollywood, and Robert D. Hetherington, Sunland, all of Calif., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Filed Jan. 9, 1986, Ser. No. 817,527
Int. Cl.[4] B67D 5/52
U.S. Cl. 222—156 8 Claims



1. A portable pail mounted pumping system comprising;

a pail cover having a skirt constructed to fit around the peripheral rim of a pail;

flange means beneath said skirt forming an annulus constructed to snugly fit the rim of said pail to stabilize a pumping system mounted on said pail cover;

pump mounting means on said pail cover, said pump mounting means including a recess in said cover constructed to extend below the rim of said pail;

pump means comprised of a pair of alternating reciprocal pumps driven by an air motor mounted on said pail cover pump mounting means, a portion of the housing of said pump means fitting into said recess in said pail cover so that when said pump means and pail cover are mounted on

a pail a low profile and center of gravity is provided to prevent the pail from tipping;

fastening means for fastening said pail cover with said pump on the rim of a pail, said fastening means being constructed to allow said pump and pail cover to be easily removed and re-mounted on another pail whereby said pail mounted pump system is easily removed and transported from one pail to another.

4,690,309

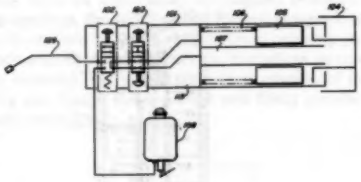
PORTABLE, SELF-POWERED, ADJUSTABLE HERBICIDE DISPENSING SYSTEM

Michael A. Wehr, Hancock, and Robert L. Sajdak, Chassell, both of Mich., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 676,147, Nov. 29, 1984, Pat. No. 4,653,830. This application Jul. 3, 1986, Ser. No. 881,995

Int. Cl.[4] G01F *11/06*

U.S. Cl. 222—249 **2 Claims**



1. A liquid dispensing device comprising:

a. a body;

b. a chamber within said body;

c. a piston slidably mounted within said chamber to form a front cavity to the front of the piston and a rear cavity to the rear of said piston so that said piston moves in a rearward and a forward direction;

d. a means for biasing said piston in the rearward direction;

e. a nozzle;

f. a combined fluid pressure means and supply of liquid;

g. a first valve and second valve each having an open and a closed position;

h. a first conduit connecting said front cavity to said second valve;

i. a second conduit connecting said rear cavity to said second valve;

j. a third conduit connecting said nozzle to said first valve;

k. a fourth conduit connecting said combined fluid pressure means and supply of liquid to said first valve;

l. a fifth and sixth conduit, each connecting said first valve to said second valve and;

wherein with said first valve in the open position said third conduit is connected to said fifth conduit and said fourth conduit is connected to said sixth conduit, and with said first valve in the closed position said fifth conduit is connected to said sixth conduit; and wherein with said second valve in the open position said first conduit is connected to said fifth conduit and said second conduit is connected to said sixth conduit, and with said second valve in the closed position said fifth conduit is connected to said sixth conduit.

4,690,310

SLEEVE PUMP

Robert Rasmussen, Minneapolis, Minn., assignor to Progressive Assembly Machine Co., Inc., Plymouth, Minn.

Filed Dec. 11, 1985, Ser. No. 807,502

Int. Cl.[4] B65B *3/30*

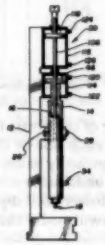
U.S. Cl. 222—309 **12 Claims**

1. An apparatus for dispensing fluid, comprising:

an outer sleeve presenting an outer sleeve casing and having structure defining an outer sleeve inlet port through said outer sleeve adapted for coupling to a source of said fluid;

an inner sleeve, presenting an inner sleeve casing, shiftably carried within said outer sleeve casing and including structure defining an internal fluid chamber, an inner sleeve inlet port through said inner sleeve in fluid communicating orientation with said fluid chamber, and a fluid chamber outlet port,

said inner sleeve and said outer sleeve shiftable relative to each other between a first position wherein said outer sleeve inlet port and said inner sleeve inlet port are aligned for fluid communication through said outer sleeve and said inner sleeve between said source of said fluid and said fluid chamber, and a second position wherein said outer sleeve inlet port and said inner sleeve inlet port are misaligned whereby fluid communication between said source of said fluid and said fluid chamber is blocked;



piston means received within said inner sleeve and shiftable along a first path of travel for drawing fluid into said fluid chamber through said inner sleeve inlet port and said outer sleeve inlet port when said inner sleeve and said outer sleeve are in said first position, and shiftable along an opposed path of travel for expelling said fluid from said chamber through said fluid chamber outlet port when said inner sleeve and said outer sleeve are in said second position;

first actuating means operably coupled to said inner sleeve and said outer sleeve for shifting said inner and outer sleeves between said first and second positions; and

second actuating means operably coupled to said piston means for shifting said piston along said paths of travel independently of the position of said inner sleeve relative to said outer sleeve.

4,690,311

BOTTLE WITH FINGER PIECES

Abraham Y. Schultz, 1233 Guelbreth La., Creve Coeur, Mo. 63141

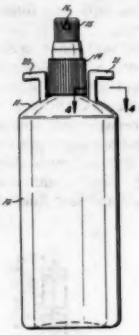
Continuation of Ser. No. 369,368, Apr. 19, 1982, abandoned. This application Apr. 25, 1986, Ser. No. 858,889

Int. Cl.[4] G01F *11/02*

U.S. Cl. 222—324 **3 Claims**

1. A bottle of a size to be grasped in one hand having finger pieces thereon including: a shoulder on the upper end of the bottle from the center of which projects a neck, the neck extending upwardly at a sharp angle to the shoulder so that the bottom of the neck merges with the shoulder in a line of demarcation around the neck, two free-standing finger pieces of similar shape integrally found with and individually and separately projecting upwardly from opposite sides of the shoulder and transversely to the shoulder of the bottle, the base portions of the finger pieces being integrally formed with the shoulder and extending upwardly from the shoulder at points outside and spaced away from the neck so that the entire lengths of the upwardly projecting portions of the finger pieces are spaced outwardly and away from the neck to provide a space between each upwardly extending portion and the neck, the finger pieces projecting upwardly and transversely to be engageable

by the fingers of a user, and terminating outwardly in outer ends so that the transverse distance from the base of each finger piece to the end of each finger piece lies substantially within the lateral limits of the bottle, the outer ends of the finger pieces being disconnected from and spaced above and



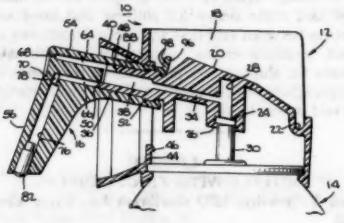
free from the shoulder of the bottle to enable a pair of digits of a hand to move from each side of the bottle so that each said digit can engage the upwardly extending portion of each finger piece and engage the undersides of the transverse portions of the finger pieces, to allow a third digit of the same hand to rest atop a cap to press downwardly thereagainst.

4,690,312

DUAL FUNCTION CAP.

James R. Crapser, and Scott W. Demarest, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed May 15, 1986, Ser. No. 863,659
Int. Cl.[4] B65D *83/00*
U.S. Cl. 222—402.17 **4 Claims**



1. An overcap assembly, comprising an actuator unit and a nozzle device, said actuator unit having means defining an outlet passage and having an acutator adapted for opening a valve of a container having contents under pressure to release the contents into said outlet passage, said nozzle device having a first outlet adapted to produce a spray of a material passing therethrough and a second outlet adapted to produce a for of a material passing therethrough, the axis of said second outlet being substantially transverse with respect to the axis of said first outlet, said nozzle device being connected to said actuator unit to selectively permit one or the other of said outlets to be in communication with said outlet passage of said actuator unit,

wherein said nozzle device is movable, while connected to said actuator unit, between first and second positions relative to said actuator unit, said first and said second outlets respectively being in communication with said outlet passage when said nozzle device is in said first and said second positions, respectively,

wherein said nozzle device and said actuator unit each have a respective cooperating locking member means for locking said actuator in a position to maintain open the valve of the container with which said assembly is being used, said locking member means being shaped and positioned so as to engage each other and lock upon operation of said actuator when said nozzle device is in said second relative position, and said locking member means being shaped and positioned so as to remain disengaged from each other when said nozzle device is in said first relative position,

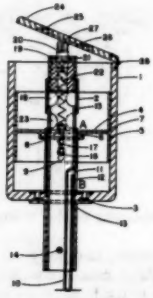
whereby actuation of the valve by said actuator will selectively produce a spray or a fog of the contents of the container.

4,690,313

BOTTLE MOUNTED ADJUSTABLE LIQUOR DISPENSING DEVICE

George J. Luine, and John L. Luine, both of 2641 N. Vermont, Los Angeles, Calif. 90027

Continuation-in-part of Ser. No. 836,736, Mar. 6, 1986, abandoned. This application Dec. 29, 1986, Ser. No. 947,436
Int. Cl.[4] G01F *11/26, 11/28*
U.S. Cl. 222—454 **9 Claims**



1. A bottle mounted liquor dispensing device which comprises: a moveable outer cylindrical housing having a longitudinal axis and a base; a slideable shutoff sleeve with a flange at one end, said shutoff sleeve affixed by its flanged end to an inner face of said base, said axis of said housing coaxial with a longitudinal axis of said sleeve and said base having an opening centrally located; a stationary filling member with an attached insertion flange member at the lower end thereof, said filling member extending upwardly through said centrally formed opening in said base, and through said shutoff sleeve to a releasing member at the upper end of said outer housing; and outer diameter of said filling member slideably and sealably compatible with an inner diameter of said shutoff sleeve as a slip-fit; said filling member having two opposing filling openings one-hundred-and-eighty degrees apart at an upper end thereof, said shutoff sleeve forming two opposing filling openings which align with said filling openings in said filling member to form a liquid passage from the bottle through the filling member and shutoff sleeve when said device is in a rest position; a rearward movement of said housing and shutoff sleeve mis-aligns said filling openings in said filling member and shutoff sleeve to close said liquid passage; an air passage member affixed to an inner wall of said filling member and extending downwardly towards said bottle with an opening at the upper end of said air passage member affixed to a formed opening in said filling member at a juncture of said filling member with said base within said outer housing, said shutoff sleeve having an elongated opening at its flanged end extending upwardly along said filling member, said elongated opening coinciding with said formed opening in said air passage member, and said elongated opening having a length pre-determined by the length of movement of said shutoff sleeve from alignment to mis-alignment of said filling openings allowing an uninterrupted flow of air from within said outer housing into said air

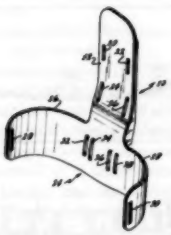
passage member; said releasing member attached at its center to an upper hinge member, and a lower hinge member anchored in a filling cap member which closes a terminal end of said filling member, and a hinge pin member connecting said upper and lower hinge members; said releasing member additionally attached at an outer edge to the outer diameter of said housing at an uppermost edge of said housing by a releasing hinge member, said releasing member being bias towards the upper end of said housing by a bias spring within said filling member; an upper end of said spring attached to said lower hinge member, and a lower end of said spring attached to a spring retaining pin affixed to a well at the lower end of said shutoff sleeve in a direction perpendicular to the longitudinal axis of said shutoff sleeve, said pin further extending through two opposing formed elongated openings one-hundred-and-eighty degrees apart in the wall of said filling member, said elongations being parallel to the axis of said filling member and said retaining pin sliding within said elongations as said shutoff sleeve is moved from a closed to an open dispensing position, the length of said formed elongations being determined by the length of movement of said shutoff sleeve relative to said filling member between aligned and mis-aligned positions of said filling openings, the width of said formed elongated openings being determined by the thickness of said retaining pin allowing for a smooth passage of said pin throughout its travel, said spring retaining pin further preventing rotation of the outer housing and shutoff sleeve around said filling member which remains stationary.

4,690,314

BUOYANCY COMPENSATOR INSERTABLE BACKPACK

Mark Faulconer, 1555 Mesa Verde East, Costa Mesa, Calif. 40100, and Scott E. Greatrake, 101 La Hacienda, Fountain Valley, Calif. 40202

Filed Aug. 26, 1985, Ser. No. 769,125
Int. Cl.[4] A45F 3/08
U.S. Cl. 224—211 **22 Claims**



1. The combination of a buoyancy compensator formed as a buoyancy compensator vest and a backpack wherein said buoyancy compensator vest has an inflator means for inflating it and maintaining it at a desired buoyancy compensation level and wherein said backpack comprises:

a T shaped inverted member formed as a unified resilient structure having an upright portion and two lateral portions extending therefrom wherein said lateral portions of said inverted T are proximate a user's lower torso area and are sufficiently flexible to flexibly curve in part around a user's waist, and said upright portion extends upwardly along a user's back:

means for connecting said backpack to said buoyancy compensator; and,

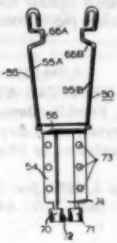
means for connecting said backpack to a tank of breathing gas.

4,690,315

UNIVERSAL CLIP

John E. Bianchi, 100 Calle Cortez, Temecula, Calif. 92390

Division of Ser. No. 655,036, Sep. 26, 1984, Pat. No. 4,627,558.
This application Apr. 25, 1986, Ser. No. 856,794
Int. Cl.[4] A45F 5/00
U.S. Cl. 224—252 **10 Claims**



1. A clip for supporting an object from the belt of a wearer comprising an elongated substantially planar body including an upstanding end portion defining an integral transverse hinge opening and said substantially planar body further defines one end of a belt loop opening:

said elongated substantially planar body further defining at least one integral catch spaced from said upstanding portion and integral hinge;

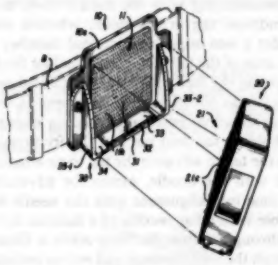
said catch means including a resilient member engaging said hinge opening and said integral catch of said substantially planar body to selectively open and close to define a belt receiving elongated opening between said clip body and said resilient means.

4,690,316

QUICK RELEASE RETENTION OF WORK PIECES

Dennis P. Peterson, P.O. Box 15809, Arlington, Va. 22215

Filed Apr. 8, 1986, Ser. No. 849,270
Int. Cl.[4] A45F 5/00
U.S. Cl. 224—253 **10 Claims**



1. A quick release retainer for a work piece, which comprises:

a receptor for the work piece;

means for attaching the receptor to a user;

means for attaching the work piece to the receptor by contact;

means for guarding against accidental separation of said work piece from said receptor, comprising

a guard which partially encloses said work piece when positioned on said receptor completely protecting a base portion of said work piece and partially protecting the adjoining sides thereof;

said guard including side guards extending parabolically and partially on the adjoining sides of said work piece

sloping gradually to the base thereof to the point of connection of said guard on said receptor; and

said guard containing a raised portion in the base thereof to enhance the ability of the user to grasp the device; and

thereby to facilitate the removal of said work piece from said receptor when the work piece is to be placed in use and simultaneously guard against inadvertent and accidental removal of said work piece from said receptor.

4,690,317

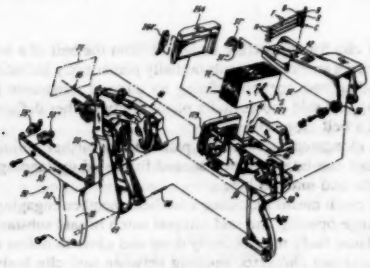
HAND-HELD TAG ATTACHER

Paul H. Hamisch, Jr., Franklin; James A. Makley; Robert M. Pabodie, both of Dayton, and Larry D. Strausburg, Waynesville, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Sep. 6, 1985, Ser. No. 773,480

Int. Cl.[4] B65C *7/00*; A43D *69/00*

U.S. Cl. 227—67 **20 Claims**



1. A hand-held tag attacher for attaching tags to merchandise using fasteners, each fastener having a bar section and a button section joined by a filament section, the attacher comprising: an attacher body having a hopper adapted to receive a stack of tags and having a manually engageable handle, a needle having an elongate needle bore and an elongate side opening communicating with the needle bore, means for engaging an endmost tag in the stack, wherein the engaging means includes a non-impaling frictional member engageable with a facial area of the tag and a tag-impaling feed pin, driver means for moving the feed pin and the frictional member from ineffective positions out of feeding engagement with the endmost tag to an effective position in feeding engagement with the tag, for holding the feed pin and the frictional member in contact with the tag to advance the tag to an attaching position in alignment with the needle, means for advancing one bar section at a time into alignment with the needle bore, a push rod engageable with a bar section of a fastener for driving the bar section through the needle bore while it filament section extends through the side opening, and means including a manually operable actuator disposed at the handle for moving the driver means, the push rod and the bar section advancing means.

4,690,318

SOLDER DISPENSER

John D. Hite, 206 Brewster Ave., Silverspring, Md. 20901

Filed Sep. 30, 1986, Ser. No. 913,298

Int. Cl.[4] B23K *20/26*

U.S. Cl. 228—57 **20 Claims**

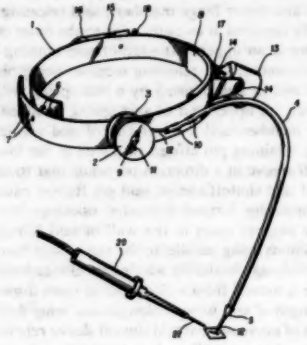
1. A head worn solder dispensing device comprising:

a head worn housing;

a supply of solder mounted onto said housing;

a means for dispensing said solder;

a guide means attached to said housing having an inlet for receiving said solder and directing said solder along a predetermined path extending through an outlet to a location where said solder may be applied to a work piece while being heated.



4,690,319

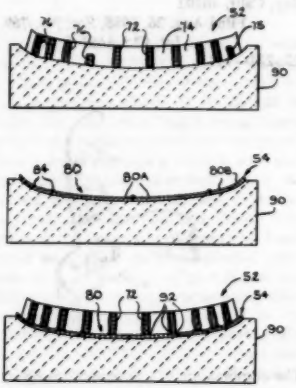
METHOD OF MAKING COMPLEXLY CURVED MOLD

Quintin R. Smith, 317 E. Fourth St., and Kellen R. Smith, 760 Brokate Rd., both of Port Clinton, Ohio 43452

Division of Ser. No. 811,544, Dec. 20, 1985, Pat. No. 4,632,691. This application Sep. 15, 1986, Ser. No. 907,330

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—182 **18 Claims**



1. A method of fabricating a mold for forming plastic material into a desired shape, comprising the steps of,

providing a pattern having such desired shape, providing a plurality of strips of metal, arranging said plurality of strips into a lattice-work grid and conforming an edge of each of said strips to an individual lineal portion of said pattern,

securing said plurality of strips to one another at intersections of said strips,

providing a plurality of plates of metal,

arranging said plates to form a mold face and conforming each of said plates to an individual area of said pattern,

securing said plates to one another and,

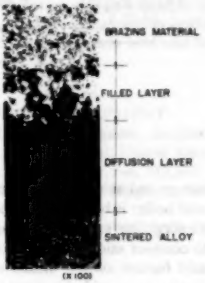
securing said plates to said lattice-work grid.

4,690,320

METHOD OF BONDING POROUS METALLIC MEMBERS AND PRODUCT MADE BY THE METHOD

Tsuyoshi Morishita; Sigemi Osaki, and Noriyuki Sakai, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 703,406, Feb. 20, 1985, abandoned.
This application Jan. 29, 1987, Ser. No. 9,094
Claims priority, application Japan, Feb. 24, 1984, 59-33748
Int. Cl.[4] B23K *20/16, 20/22*
U.S. Cl. 228—194 7 Claims



1. A method of bonding a metallic member to an iron-based material having a porous structure, said method comprising the steps of:

preparing a metallic material by combining 30 to 70 wt % of Fe-Cr type alloy powders with 70 to 30 % of Fe-C-P-Mo type eutectic alloy powders which are finer than 150 mesh, said Fe-Cr type alloy containing 10 to 15 weight % Cr, and less than 1.5 weight % of at least one of C, P, Si, S, Mn and Ni, and the balance Fe, and said Fe-C-P-Mo eutectic alloy containing 3.5 to 4.5 weight % C, 1.8 to 2.8 weight % P, 8 to 12 weight % Mo, less than 4 wt % of at least one of Cr, Si, Mn and Ni, and the balance Fe,;

mixing 90 to 99% of said metallic material with 10 to 1% of an organic binder comprising an acrylic resin to form a brazing material;

placing said brazing material between said metallic member and said iron-based material;

preheating said brazing material at 150° to 380° C. for at least 5 minutes to cause said organic binder to become adhesive so that said metallic member and said iron-based material remain securely intact during subsequent bonding steps;

heating said brazing material, said metallic member and said iron-based material to a temperature above the melting point of said brazing material so that the elements of the eutectic powders of said brazing material diffuse into the surfaces of the pores of said iron-based material; and

preventing further diffusion of said brazing material into said pores by cooling said brazing material, said metallic member, and said iron-based material.

4,690,321

FOLDABLE QUICK PACK FOR FOODSTUFFS AND THE LIKE

Lolita Spaeth, Wendeberg 43, 3180 Wolfsburg, Fed. Rep. of Germany

Filed Sep. 16, 1986, Ser. No. 907,804
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533068
Int. Cl.[4] B65D *5/02*
U.S. Cl. 229—40 4 Claims

1. A box-like quick pack, formed from a folded blank, for goods sensitive to pressure, particularly foodstuffs, comprising:

(a) a baseplate having front, side and back fold edges and having sufficient inherent stiffness to support the goods;

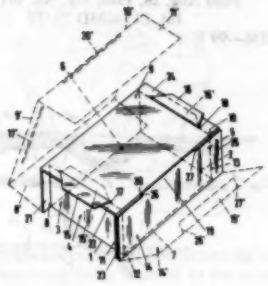
(b) two side walls directed substantially vertically upwards starting from two opposite side edges of the baseplate;

(c) a rear wall which starts from the rear edge of the baseplate and is directed upwards and which merges into a lid and front wall;

(d) side portions of said rear wall and lid overlapping the edges of the two side walls and projecting beyond the periphery of the baseplate;

(e) said side walls having fold-over flaps adapted to pass through slits formed in said lid;

(f) said lid being extended at its front edge by a downwardly directed first front wall;



(g) a second front wall directed upwards and lying against the first front wall, said second front wall being foldably attached to the front edge of said baseplate;

(h) said first front wall extending between said second front wall and the front edges of said two side walls;

(i) a push-in tongue foldably attached to the top edge of said second front wall; and

(j) a slit formed in said first front wall near the front edge of said lid and into which said tongue extends when the pack is assembled, and wherein

(k) said fold-over flaps are sufficiently long that they can be folded over said lid to lie approximately parallel to it.

4,690,322

RESEALABLE ENVELOPE

Joseph E. Burns, 754 Chandler Rd., Gurnee, Ill. 60031

Filed Oct. 31, 1986, Ser. No. 926,359
Int. Cl.[4] B65D *27/06, 27/16*
U.S. Cl. 229—80 5 Claims

1. A resealable envelope comprising: a first paper panel including a wall portion and a flap portion; a second paper panel disposed in face-to-face relation with the wall portion of said first panel; a first plastic strip fixedly secured to said flap portion of said first panel; a second plastic strip fixedly secured

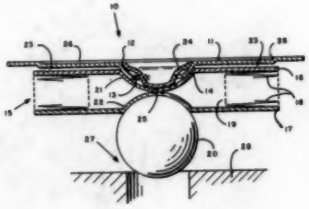
to said second panel; said first panel being foldable to place said flap portion in overlapping relation with said second panel and said first strip in registration with said second strip; a tape having a pressure sensitive contact adhesive on one face thereof, said adhesive being in contact with one of said strips and releasably securing said tape to said one strip, said adhesive remaining on said one strip upon removal of said tape and effecting sealing of said envelope by contacting the other strip when said strips are brought into registration and pressed against each other.

4,690,323

SWIVEL BELLOWS ASSEMBLY

David L. Morgan, Stratford, Conn., assignor to Seymour-Sheridan, Inc., Stratford, Conn.

Filed Aug. 28, 1986, Ser. No. 901,330
Int. Cl.[4] G05D *23/12*
U.S. Cl. 236—99 F **6 Claims**



1. A thermostatic swivel bellows assembly designed for attachment within a housing to perform a function in response to predetermined temperatures therewithin, said assembly comprising a bellows mounting plate having an opening surrounded by a portion of said plate which is downwardly and inwardly deformed to provide a tapered skirt, a thermostatic bellows unit having an upper end surface and a lower end surface, said upper end surface being adjacent said mounting plate and being provided with a central contoured well portion which receives the tapered skirt of the mounting plate, a flexible, contoured retainer cup which confines the skirt of the mounting plate in frictional engagement between itself and the well of said upper end surface and which extends through said opening and is permanently attached within said well portion to said upper end surface to permit swivel movement between said mounting plate and said bellows unit, said lower end surface being provided with a central work member for altering an opposed element when said bellows unit is expanded, said swivel movement permitting the bellows unit to align the work member with the opposed element during use.

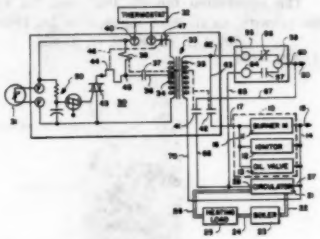
4,690,324

OIL BURNER CONTROL FOR HYDRONIC SYSTEM

Donald J. Kasprzyk, Maple Grove, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 27, 1986, Ser. No. 879,733
Int. Cl.[4] F24D *3/00*
U.S. Cl. 237—8 R **5 Claims**

1. A control for an oil burner heated boiler connected to a hydronic system having a circulator, including: oil burner control means having a step-down transformer and connection means for powering said oil burner control means and adapted to be controlled by a thermostat; said burner control means further including relay means having a plurality of normally open relay contacts with said contacts being operated to a closed state in response to the operation of said thermostat; a first of said relay contacts latching said relay means into an operated state upon operation of said thermostat; boiler water temperature limit control means having a high temperature limit switch that open circuits upon the water in said boiler reaching an upper temperature limit; said limit control means including a further switch means that closes when said high temperature limit switch opens; said high temperature limit switch including connection means connecting said oil burner control means, said oil burner, and a second normally open relay contact of said relay means in a first circuit means which is adapted to be connected to a line voltage source to energize



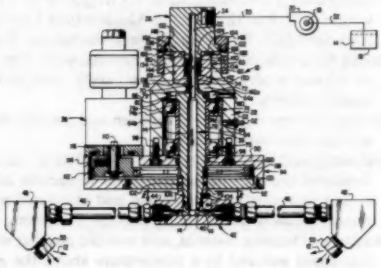
said oil burner and said oil burner control means when said water in said boiler is below said upper temperature limit; and circulator energizing means including a second circuit means adapted to connect said circulator to said line voltage source through said further switch means when said further switch means closes to cause said circulator to operate when said high temperature limit switch is open circuited.

4,690,325

HIGH PRESSURE FLUID DELIVERY SYSTEM

Amos Pacht, Houston, Tex., assignor to Butterworth Jetting Systems, Inc., Houston, Tex.

Filed Sep. 17, 1986, Ser. No. 908,280
Int. Cl.[4] B05B *3/02*
U.S. Cl. 239—124 **25 Claims**



1. High pressure fluid delivery apparatus comprising:

(a) wall means defining a housing having intercommunicating first and second chambers;

(b) a hollow, open-ended fluid delivery shaft extending through said first chamber, said shaft having an inlet end portion projecting into said second chamber, and an outlet end portion;

(c) bearing means, positioned within said first chamber, for supporting said shaft for rotation relative to said housing, said bearing means defining with the interior surface of said first chamber a subchamber interposed between said bearing means and said second chamber;

(d) means for rotating said shaft relative to said housing;

(e) means, carried by said outlet end portion of said shaft for rotation therewith, for converting high pressure fluid discharged from said outlet end portion of said shaft to a high pressure spray;

(f) an inlet member having an inlet opening for receiving high pressure fluid from a source thereof, a discharge

portion facing and spaced from said inlet end portion of said shaft and adapted to discharge high pressure fluid into and through said shaft, and an internal flow passage extending from said inlet opening outwardly through said discharge portion;

(g) seal means, removably positioned in said second chamber, for sealingly and rotatably interconnecting facing portions of said inlet end portion of said shaft and said discharge portion of said inlet member;

(h) means, removably connected to said housing, for captively associating said inlet member and said seal means with said housing; and

(i) means for directly venting said subchamber to limit fluid pressure within said housing caused by leakage of high pressure fluid past said seal means into said housing.

4,690,326

SPRAYING EQUIPMENT

David C. Gill, Bristol, United Kingdom, assignor to Nomix Manufacturing Co. Limited, Bristol, United Kingdom

Filed Mar. 18, 1985, Ser. No. 713,185

Claims priority, application United Kingdom, Mar. 19, 1984, 8407088

Int. Cl.[4] **B05B** *3/10*; **A62C** *31/02*; **F16K** *5/10*; **B25G** *3/02*

U.S. Cl. 239—223 **5 Claims**

1. A spraying head comprising a body and a rotary distribution element supported by the body, the body comprising:

a first body component having a projection which extends coaxially with the distribution element;

a second body component having an aperture in which the projection is situated, the second body component being connected rotatably to the first body component;

an annular gap defined between the projection and the periphery of the aperture;

an annular cavity defined between the first and second body components, the cavity communicating with the gap;

inlet means, opening into the cavity, for material to be sprayed;

a first opening provided in the second body component;

a plurality of second openings provided in the first body component, the first opening being movable selectively into alignment with the second openings by rotation of the second body component relatively to the first body component;

a plurality of metering orifices of different crosssectional area from each other, each metering orifice providing communication between a respective one of the second openings and the cavity; and

an inlet fitting which is removably insertable into the first opening and an aligned one of the second openings, thereby to retain the body components against rotation relative to each other.

4,690,327

HOT GUNNING ROBOT FOR FURNACE LINING

Kiyoshi Takai, Nishinomiya, and Akinori Kaseya, Ashiya, both of Japan, assignors to Godo Steel, Ltd., Osaka, Japan

Filed Jan. 31, 1986, Ser. No. 824,835

Int. Cl.[4] **B05B** *3/02*

U.S. Cl. 239—226 **9 Claims**

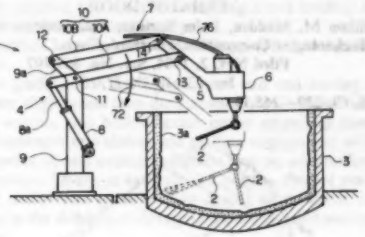
1. A hot gunning robot for applying a lining material to interior surfaces of a furnace to obtain a furnace lining, comprising:

support base means;

a shifting arm operatively connected to the support base means and a nozzle carrier attached to the shifting arm;

parallelogram-link means connecting the support base means to the shifting arm for moving said shifting arm in a constant orientation between a first position wherein said nozzle carrier and shifting arm are located substantially entirely outside said furnace and a second position wherein said nozzle carrier is inside the furnace, said parallelogram-link means being substantially entirely located outside the furnace in either the first or second position of the nozzle carrier;

a substantially vertical feed pipe rotatably mounted in said nozzle carrier;



a gunning nozzle and means for connecting the nozzle to the pipe for supplying lining material to the nozzle through the pipe, said connecting means including

a cylindrical nozzle supporter with an inlet port communicating with the lower end of said feed pipe;

said gunning nozzle having nozzle base means fitted on said cylindrical nozzle supporter for allowing the gunning nozzle to tilt in relation to the vertical feed pipe and thereby supply lining material to substantially entirely all interior surfaces of the furnace, wherein said cylindrical nozzle supporter has a wide angle outlet port defined by side wall means divergently flared in the downstream direction of feed and a guide vane connected to the nozzle supporter and located within the nozzle supporter between said outlet port and said inlet port.

4,690,328

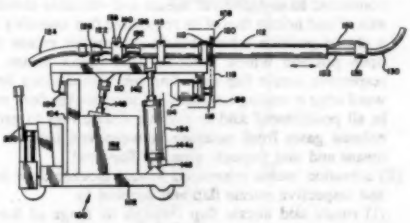
SPRAYING MACHINE

Franz Roehl, Frankfurt am Main, Fed. Rep. of Germany, assignor to Bentonspritz Nascgubeb GmbH Co., Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,655

Int. Cl.[4] **B05B** *3/00*

U.S. Cl. 239—227 **14 Claims**



1. A spraying device including a stationary frame having a base, an arm universally pivoted at one end on said base and having a free end with an application nozzle on said free end, at least a pair of ground-engaging wheels on one end of said base, extensible support means on an opposite end of said base, and a three-wheel power driven truck including a drive wheel

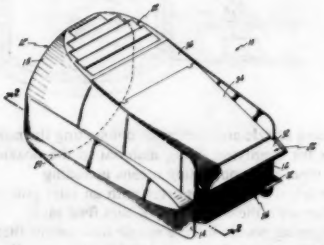
and a pair of retractable jack wheels, said truck having a movable fork, said one end of said base having slot means receiving a free end of said fork, said free end of said fork abutting a surface of said slot means to support said fork with said fork being in engagement with and supporting said base by said opposite end so that said extensible support means and retractable jack wheels can be retracted and said stationary frame and truck become one unit supported by said ground-engaging wheels and said drive wheel and said power driven truck can be used to position said application nozzle with respect to a working surface.

4,690,329

EXHAUST NOZZLE COUPLED WITH REVERSER EXHAUST DOOR

William M. Madden, Palm Springs, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 2, 1984, Ser. No. 667,707
Int. Cl.[4] B63H *11/10*
U.S. Cl. 239—265.19 **4 Claims**



1. An exhaust nozzle assembly for an aircraft engine, said engine having a centerline and comprising:

exhaust duct means including means defining reverse flow outlet means, said exhaust duct means having spaced apart stationary sidewall means; and

an upper and lower flap assembly each including a nozzle flap having a forward edge and rearward edge, said nozzle flaps each extending between and pivotally secured to said sidewall means, said flaps being spaced apart and rotatable about respective parallel axes and forming between them a gas flow path having an exit area defined by said flap rearward edges and said sidewall means, said nozzle flaps being rotatable through a range of forward thrust positions and a range of reverse thrust positions including a full reverse thrust position wherein said rearward edges meet at said engine centerline and said exit area is reduced to zero, each flap assembly including:

(A) blocker door means extending between and pivotally connected to said sidewall means and rotatable about said axis of said nozzle flap of its respective flap assembly from a closed position which blocks said outlet means to an open position which unblocks said outlet means, said respective nozzle flap including seal means along its forward edge in sealing contact with said blocker door means in all positions of said respective nozzle flap to prevent exhaust gases from escaping between said blocker door means and said respective nozzle flap; and

(B) actuation means connected to said blocker door means and respective nozzle flap and adapted to

(1) rotate said nozzle flap through its range of forward thrust positions and its range of reverse thrust positions;

(2) maintain said blocker door means stationary and in its closed position as said respective nozzle flap moves through its range of forward thrust positions; and

(3) rotate said blocker door means from its closed position to its open position about said respective nozzle flap axis as said nozzle flap is rotated through its range of reverse thrust positions, said respective nozzle flap adapted to direct the engine exhaust through said outlet means when said blocker door means is in its open position

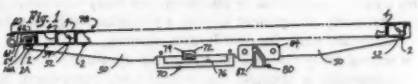
wherein said actuation means includes a cam track connected to said respective flap means for rotation therewith, said actuation means also including a cam follower and linkage means connected to said cam follower, said linkage means having a first end pivotally connected to one of said sidewall means and a second end operably connected to said blocker door means, said cam follower being disposed within said cam track, said cam track being adapted to maintain said linkage means substantially stationary as said flap means rotates through its range of forward thrust positions and adapted to move said second end of said linkage means to rotate said blocker door means to its open position as said flap means rotates through its range of reverse thrust positions.

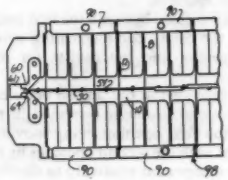
4,690,330

LOUVERED SEAL FLAP EDGE STIFFENER

Ronald L. Robinson, Palm Beach Gardens, and Fred L. Honeycutt, Jr., Lake Park, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 2, 1985, Ser. No. 804,021
Int. Cl.[4] F02K *1/06*
U.S. Cl. 239—265.39 **6 Claims**





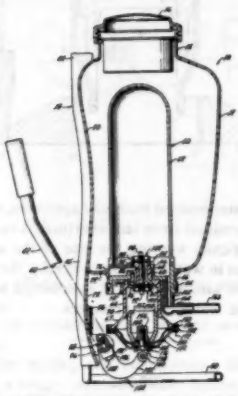
1. An exhaust nozzle flap having an inner hot flow directing side and an outer side; said nozzle flap having a forward end, a rearward end, and two side edges; said nozzle flap including a longitudinal series of louver elements between the forward end and rearward end; said series of louver elements each having a forward U-section; said U-section having an integrally connected forward leg, bottom portion, rearward leg, and open end; a plate member extending rearwardly from the rearward leg at the open end of each forward U-section, said forward leg of each U-section being located against the rearward leg of each forward adjacent U-section and fixed thereto; each plate member extending rearwardly over the open end of the rearward adjacent U-section, said plate members forming the inner hot flow directing side of the nozzle flap; beam means extending longitudinally along said U-sections and fixed thereto; said plate members each having side ends, said side ends forming side edges of the nozzle flap; stiffener means covering the length of the side edges of the nozzle flap; means fixing said stiffener means to the side edges of the nozzle flap.

4,690,331

SPRAYER AND DIAPHRAGM PUMP THEREFOR

Pedro W. Luchsinger, Kilometer 445 of the Panamericana Road, Lagos de Moreno 047400, Jalisco, Mexico

Continuation of Ser. No. 616,012, May 31, 1984, abandoned. This application Apr. 7, 1986, Ser. No. 848,786
Claims priority, application Mexico, Jun. 6, 1983, 197539
Int. Cl.[4] B05B 9/043
U.S. Cl. 239—333 6 Claims



1. A manually operated sprayer for dispensing liquid insecticides, herbicides or pesticides comprising

a liquid container having a first sealable opening for receiving liquid to be dispensed from the container, and having a second opening,

a pressure vessel mounted within said container and sealed to said second opening, said pressure vessel having an internally threaded pump-receiving fitting communicating with the interior thereof and with said container, said pressure vessel having a discharge fitting providing communication between the interior thereof and ambient atmosphere,

a pump housing having a generally cylindrical section and having a connecting section coaxial with said generally cylindrical section and detachably secured and sealed to said pump-receiving fitting of said pressure vessel, a downwardly and outwardly flared chamber section integral with said cylindrical section at an end remote from said connecting section and having an outwardly extending peripheral flange,

a cover section having an outwardly extending peripheral cover flange,

a peripheral groove formed in one of said flanges,

a stiff but resilient generally bell shaped diaphragm having a peripheral edge thereof secured to and between said flanges and having a normal inverted orientation for forming a liquid receiving pumping chamber within said pump housing between said diaphragm and said connecting section,

said diaphragm having a flat central portion lying in a plane displaced from the plane of said diaphragm peripheral edge and connected to said diaphragm peripheral edge by an integral dome shaped intermediate portion, whereby the central portion moves between extreme positions that are spaced from one another by a distance that is a major fraction of the diaphragm radius, and whereby the intermediate portion flexes and reverses its curvature during pumping action, and whereby the stiff but resilient diaphragm provides an over-the-center snap type action that tends to return the diaphragm to hold it in its normally inverted orientation,

said diaphragm having a peripheral bead received in said peripheral groove,

a continuous peripheral clamping ring extending around and over both said flanges and clamping said flanges and the interposed diaphragm edge therebetween to thereby securely hold said flanges and interposed diaphragm in interconnected and sealed relation, said clamping ring, flanges and diaphragm peripheral edge being free of fastening apertures,

a rigid circular diaphragm cap on said diaphragm adjacent said cover section,

an actuating lever pivotally mounted to said container and having an end pivoted directly to said diaphragm cap whereby at least portions of the diaphragm are driven in an arcuate path during said pumping and suction strokes, thereby tending to distort the diaphragm and tending to cause it to bend asymmetrically,

said cylindrical housing section including a cylindrical guide section,

a hollow guide piston having a closed end and having a diameter slightly less than the diameter of said cylindrical guide section, said hollow guide piston extending from said diaphragm into sliding and guiding engagement with the interior of said cylindrical guide section, said hollow guide piston having at least an end portion thereof positioned within said guide section during all positions assumed by the diaphragm during said pumping and suction strokes,

fastener means having an end contained within said hollow piston and extending through said closed end and through said diaphragm for holding said hollow piston and said diaphragm cap rigidly clamped together with said central diaphragm portion interposed therebetween, whereby only said dome shaped intermediate diaphragm section bends during said pumping and suction strokes, and

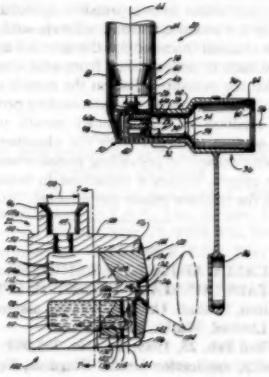
valve means in said connecting section and one end of said guide section for controlling flow to and from said pumping chamber.

4,690,332

SINGLE INLET PREPACKAGED INHALER

Nathaniel Hughes, 1934 Sonora Rd., Palm Springs, Calif. 92662

Continuation-in-part of Ser. No. 555,703, Nov. 28, 1983, Pat. No. 4,635,857. This application Sep. 18, 1984, Ser. No. 652,754
Int. Cl.[4] A61M 11/06
U.S. Cl. 239—338 1 Claim



1. An inhaler for administering a medicine containing aerosol, comprising

an inlet having a first axis for accepting a discharge tube of a container containing a propellant and a medicant;

a transducer body having a second central axis along a

length of the body and coupled to the inlet wherein the second central axis is normal to a plane containing the first axis and wherein the transducer body comprises an outlet;

a central cylindrical bar coaxial with the second central axis, extending substantially the length of the body and having a free end with a groove formed longitudinally in an outer surface of the bar;

a lens mounted on the free end of the bar to form a substantially airtight fit between the lens and the outer surface of the bar and at least partly within the body;

a first expansion chamber defined by first chamber walls adjacent the body downstream from and adjacent the outlet;

a second expansion chamber defined by second chamber walls downstream from and adjacent the first expansion chamber; and

a screen mounted to an end of the second expansion chamber.

4,690,333

MEDIA MIXING NOZZLE ASSEMBLY

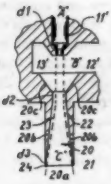
Lars-Erik Johansson, Växjö , Sweden, assignor to Fläkt AB, Nacka, Sweden

Filed Apr. 2, 1985, Ser. No. 719,236

Claims priority, application Sweden, Dec. 4, 1984, 8406144

Int. Cl.[4] B05B *7/04*

U.S. Cl. 239—434.5 **10 Claims**



1. A media mixing nozzle assembly arranged in a contact reactor, said nozzle assembly being arranged partly to enable a first medium to be mixed with a second medium, and partly to cause the resultant mixed medium to be mixed with and to be used to cleanse a contaminated medium fed to the contact reactor, said mixed medium containing an absorption substance, which reacts with the impurities contained in the contaminated medium, whereby said first medium and said second medium are passed, under an overpressure, to a chamber in the nozzle assembly for mixture therein, wherein said chamber is connected to a channel intended for the mixture and having a cross-section which diverges away from said chamber by a degree such that the pressure adjacent the mouth of the channel coincides substantially with the surrounding pressure of the contaminated medium at said channel mouth wherein the channel cross-section diverges from the chamber and has a form which, with respect to prevailing pressure and as a result of irreversible effects, causes a reduction in both speed and pressure while the mixture passes the channel.

4,690,334

AUTOMATICALLY ADJUSTABLE SHOWER HEAD TO MAINTAIN CONSTANT PRESSURE SPRAY

Martin W. Dalton, Solihull, United Kingdom, assignor to Triton Aquatherm Limited, Warks, England

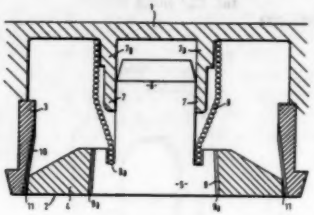
Filed Feb. 25, 1985, Ser. No. 705,081

Claims priority, application United Kingdom, Feb. 25, 1984, 8404976

Int. Cl.[4] B05B *1/18, 1/30*

U.S. Cl. 239—452 **12 Claims**

1. A water spraying device comprising: a spray head and means for supplying water under pressure to a chamber located within said head, said head including a face element comprising a plurality of annular concentric spray rings, each ring having an inner and an outer peripheral wall extending axially of said face element, the outer peripheral wall of one ring lying adjacent the inner peripheral wall of a second ring, a plurality of spray ring apertures communicating with said chamber being formed by axially directed serrations cut in the peripheral wall of at least one of said adjacent rings to define a



spray pattern of water emitted from said apertures, wherein the pressure of water emitted from said apertures is controlled by means for automatically varying the size of the apertures in response to changes in water pressure whereby the pressure of water emitted from said apertures is maintained substantially constant at variable water input pressures.

4,690,335

METHODS AND APPARATUS FOR TWO-STAGE CRUSHING

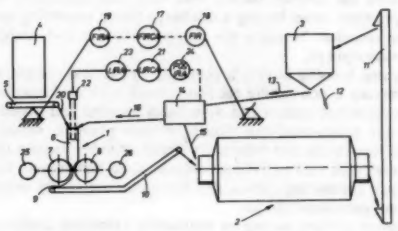
Tyark Allers, Sendenhorst, and Gotthardt Blasczyk, Beckum, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Bekum, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 837,946

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1985, 3520069

Int. Cl.[4] B02C *25/00*

U.S. Cl. 241—24 **4 Claims**



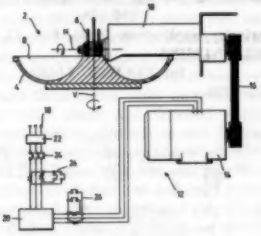
1. In a two-stage method of crushing brittle material wherein fresh material is delivered via a filling chute to a first roll mill having a pair of spaced apart rotary rolls, agglomerates from the roll mill are passed to a second mill, the discharge of said second mill is sifted to separate finished material and grit, and grit is returned to at least one of said mills for further crushing, the improvement comprising rotating the rolls of said roll mill at a substantially constant speed, adjusting the quantity of fresh material delivered to said filling chute in generally inverse relationship to the total quantity of returned grit to keep the sum of the quantities of fresh material and grit being processed constant during fluctuations in grindability of said fresh material, delivering to said first roll mill a quantity of said returned grit sufficient to maintain a substantially constant level of grit and fresh material in said filling chute irrespective of fluctuations in the adjusted quantity of fresh material supplied, and delivering the remaining quantity of said returned grit directly to said second mill.

4,690,336

APPARATUS AND METHOD FOR DRIVING RAW SAUSAGE MEAT PROCESSING CUTTER

Tsuyoshi Higashimoto, Ikoma, Japan, assignor to Higashimoto Kikai Co., Ltd., Japan

Filed Oct. 21, 1985, Ser. No. 789,394
Claims priority, application Japan, Oct. 31, 1984, 59-231097
Int. Cl.[4] B02C *25/00*
U.S. Cl. 241—30 **5 Claims**



1. An energy-efficient, raw sausage meat processing apparatus, comprising:

(a) a bowl for containing raw sausage meat lumps to be processed;

(b) means for mixing and comminuting the meat lumps, including a rotary cutter rotatably driven in the bowl;

(c) a frequency-controlled, variable speed, AC drive motor having a plurality of poles and energized by an electrical power source, said motor having an output shaft on which the cutter is mounted for rotation at low speeds for mixing and coarsely cutting the meat lumps, and at high speeds for mixing and finely cutting the meat lumps; and

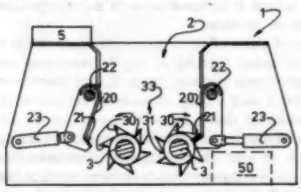
(d) control means for controlling the motor speed as a function of frequency and the number of poles for the motor, including a frequency converter operatively connected between the power source and the motor, and means for adjusting the frequency of the converter for changing the motor speed to a desired energy-efficient magnitude appropriate for processing the meat lumps without spoiling their inherent flavor.

4,690,337

ROLL CUTTING MACHINE FOR COMMINUTION OF BULKY REFUSE

Jakob Stiefel, Lindenhof 4, 8604 Volketswil, Switzerland

Filed Dec. 16, 1985, Ser. No. 809,326
Claims priority, application Switzerland, Jul. 17, 1985, 3105/85
Int. Cl.[4] B02C *13/00*
U.S. Cl. 241—36 **10 Claims**



1. A roll cutting machine for comminution of bulky refuse, comprising:

a charging hopper;

two rolls arranged substantially axially parallel to each other;

rotary drive means for rotatably driving said two rolls in opposite directions of rotation;

said two rolls forming a common roll gap therebetween;

each one of said two rolls being provided with a predetermined number of axially spaced annular zones;

each one of said predetermined number of annular zones being provided with a related roll tooth;

each roll tooth of each annular zone of each roll being radially spaced from the related roll tooth at the annular zone of the other roll of said two rolls so that the roll teeth at said two rolls fail to overlappingly interleave with one another at the region of the common roll nip;

said charging hopper possessing two hopper wall sections each of which is arranged adjacent a related one of said two rolls;

said rotary drive means rotatably driving said two rolls in said opposite directions of rotation such that each one of said two rolls is rotatably driven in a direction away from the top side of said common roll gap towards a related one of said two hopper wall sections which is arranged adjacent each said related roll;

each one of said two hopper wall sections containing a lower region and being provided in said lower region with a predetermined number of hopper teeth and tooth spacings therebetween;

said predetermined number of hopper teeth being displaceable between an operative position and an inoperative position;

each roll tooth of each one of said two rolls, when said two rolls are rotatably driven by said rotary drive means, cuttingly passing through a related one of said tooth spacings between related ones of said hopper teeth of a related one of said two hopper wall sections and in said operative position of said predetermined number of hopper teeth;

means for displacing a preselected number of said predetermined number of hopper teeth of each one of said two hopper wall sections into said inoperative position in response to the action of a predetermined force effective between said preselected number of hopper teeth and related ones of said roll teeth;

said displacing means serving to displace said hopper teeth away from said related one of said two rolls into said inoperative position;

said preselected number of said hopper teeth of each of said two hopper wall sections being pivotably displaceable in response to the action of said predetermined force and between said operative position and said inoperative position by pivoting said preselected number of said hopper teeth about a predetermined pivot axis which extends axially parallel to said related one of said two rolls in order to prevent blockage of the charging hopper by the bulky refuse.

4,690,338

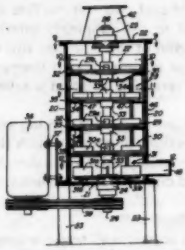
SOLID FUEL PULVERIZER FOR PULVERIZED FUEL BURNING SYSTEM

William H. Sayler, Salt Lake City, and Justin C. White, Magna, both of Utah, assignors to T.A.S., Inc., Magna, Utah

Division of Ser. No. 588,900, Mar. 12, 1984, Pat. No. 4,531,461, which is a continuation of Ser. No. 378,347, May 14, 1982, abandoned, which is a continuation-in-part of Ser. No. 216,267, Dec. 15, 1980, abandoned. This application Mar. 8, 1985, Ser. No. 709,911
Int. Cl.[4] B02C *13/288*
U.S. Cl. 241—56 **9 Claims**

1. A solid fuel pulverizer, comprising a vertical shaft rotatably mounted in a vertically positioned substantially cylindrical housing having a top wall, cylindrical side wall, and bottom wall; a series of horizontal impellers fixed to said shaft in mutually spaced arrangement and terminating short of but relatively close to said housing to define therewith relatively narrow peripheral flow space therearound, said impellers being provided with air-motivating, solid particle impact members

thereon, and the inside face of the cylindrical side wall of said housing being provided with mutually spaced, substantially vertical, impact bars positioned within said flow space; a series of annular, substantially flat and horizontal partitions fixed to the housing, the individual partitions thereof extending peripherally inwardly thereof between mutually adjacent impellers, each of said individual partitions being spaced closely below



and underlying a corresponding impeller to direct flow toward the axis of said shaft in opposition to centrifugal force exerted by the impellers; air inlet means in said top wall of the housing for introducing primary air to provide a carrier stream of air; solid fuel inlet means also in said top wall of the housing for introducing solid fuel to be pulverized; discharge conduit means adjacent to the lower end of the housing; and means for rotating the impeller shaft.

4,690,339

HAMMER MILL

Richard Schultz, Morschwil SG, CH-9402 Morschwil, Switzerland

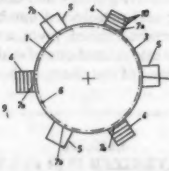
PCT No. PCT/CH85/00183, § 371 Date Aug. 29, 1985, § 102(e) Date Aug. 29, 1985, PCT Pub. No. WO86/03990, PCT Pub. Date Jul. 17, 1986

PCT Filed Dec. 30, 1985, Ser. No. 912,249

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1985, 3500032; Switzerland, Dec. 23, 1985, 05521/85

Int. Cl.[4] B02C *13/286*

U.S. Cl. 241—73 **7 Claims**



1. A hammer mill having a grinding chamber, a rotor with hammers or beaters, and means for feeding coarse material and discharging a product of reduced size, said grinding chamber being arranged substantially horizontally, said rotor being supported on a vertical axis, said means for feeding coarse material and discharging a product comprising a plurality of supply ducts with corresponding inlets for feeding said coarse material for size reduction and a plurality of discharge ducts with corresponding outlets for discharging said product of reduced size from said grinding chamber, said supply ducts and discharge ducts being arranged on the periphery of said grinding chamber in such manner that each supply duct with its inlet is associated with a corresponding discharge duct with an adjacent outlet, said outlets each being positioned between two inlets on the periphery of said grinding chamber, whereby said grinding chamber is subdivided peripherally into a corresponding number of mill segments each of which is defined by an inlet and a corresponding outlet.

4,690,340

WASTE MATERIAL SHREDDER

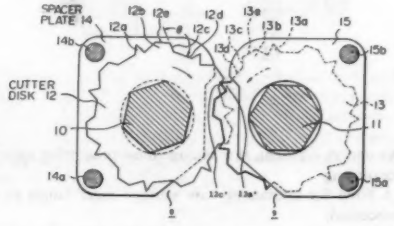
Takefumi Hatanaka, No. 1-4-13, Midori-cho, Koganei-shi, Tokyo, Japan

Continuation of Ser. No. 689,272, Jan. 7, 1985, abandoned, which is a continuation-in-part of Ser. No. 465,969, Feb. 14, 1983, abandoned. This application Jun. 27, 1986, Ser. No. 880,638

Claims priority, application Japan, Feb. 12, 1982, 57-17236; Jul. 19, 1982, 57-125582

Int. Cl.[4] B02C *13/20*

U.S. Cl. 241—236 **8 Claims**



1. A waste material shredding apparatus for converting sheets of waste material into small chips, comprising:

a supporting frame;

first and second counter-rotating cutter rollers;

mounting means for mounting said first and second cutter rollers in said supporting frame for rotation about respective axes thereof;

first and second sets of spacer plates fixedly mounted on said supporting frame;

said first and second cutter rollers comprising first and second roller shafts, respectively, disposed mutually parallel to each other, and first and second sets of cutter disks pointed coaxially along said first and second shafts, respectively, with adjacent ones of said first set of cutter disks being mutually separated by one of said first set of spacer plates, and adjacent ones of said second sets of cutter disks being mutually separated by one of said second set of spacer plates, first fixing means fixing said first set of cutter disks to said first shaft, second fixing means fixing said second set of cutter disks to said second shaft, said mounting means mounting said first and second cutter rollers on said supporting frame to provide a mutual interacting relationship between said first and second sets of cutter disks in which the relative position between said first and second sets of cutter disks is repeatedly the same for each revolution of said first and second sets of cutter disks, each of said cutter disks having an outer peripheral surface which is concentric with a corresponding one of said axes of rotation;

a plurality of pairs of protrusions on each cutter disk, with each pair being formed at regular spacings around said outer peripheral surface, each of said pairs comprising a cutter tooth and a chip clearance protrusion leading the cutter tooth of that pair with respect to the direction of rotation of said each cutter disk, each of said cutter teeth and each of said chip clearance protrusions protruding radially outward from said peripheral surface, each of said cutter teeth having a tip portion formed with a sharp cutting edge which is disposed substantially parallel to said axes of rotation, each of said chip clearance protrusions having a blunt surface as viewed along the direction of rotation, each of said chip clearance protrusions having a leading face leading said chip clearance protrusion with respect to the direction of rotation thereof, said cutting

edge defining the outermost radial boundary of each cutter tooth, and said blunt surface defining the outermost radial boundary of each chip clearance protrusion, the radial distance between said outermost radial boundary of each cutter tooth and the axis of rotation of its respective cutter disk being substantially equal to the radial distance between said outermost radial boundary of each chip clearance protrusion and the axis of rotation of its respective cutter disk,

said first and second fixing means and said mounting means providing said mutual interacting reationship so that each one of said cutter teeth on a first cutter disk on one roller shaft is repeatedly at a position in which the tip portion of said one cutter tooth overlaps a a pair of leading faces of a pair of chip clearance protrusions, respectively, formed on second and third cutter disks mounted on the other face of said roller shafts and disposed respectively on either side and closely adjacent to said first cutter disk, said overlapping relationship arising when said one cutter tooth on said first cutter disk and said pair of chip clearance protrusions on said second and third cutter disks are approaching one another, so that said pair of leading faces of said pair of chip clearance protrusions on either side of said one cutter tooth supports said waste material as said sharp cutting edge of said one cutter tooth penetrates said waste material to effect a cross-cut with minimal resistance and thereby produce a cross-cut waste chip;

the chip clearance protrusion on said first cutter disk which forms said pair of protrusions with said one cutter tooth and which leads said one cutter tooth in the direction of rotation of said first cutter disk being constructed to engage said waste chip which has just been cross cut and to push said just cut waste chip radially outwardly away from said one cutter tooth and downwardly to thereby remove the waste chip from the cutter apparatus, the aforesaid being sequentially repeated for each pair of cutter teeth and chip clearance protrusions on each cutter disk such as to preclude chip build-up and thereby provide jam-free operation.

4,690,341

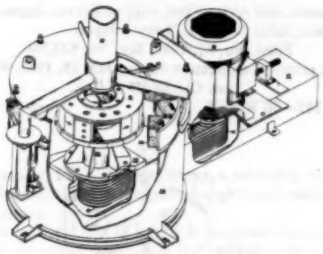
IMPACT CRUSHER ROTATING IMPELLER TABLE

Mason R. Hise, P.O. Box 732, Placitas, N. Mex. 87043, and Neil R. Hise, P.O. Box 722, Placitas, N. Mex. 87048

Filed Feb. 3, 1986, Ser. No. 825,396

Int. Cl.[4] B02C *23/00*

U.S. Cl. 241—275 **22 Claims**



1. In a vertical axis secondary impact crusher, a rotating impeller table assembly comprising:

a rotatable housing having upper and lower annular end plates and a vertical axis of rotation, said housing having cylindrical walls containing side discharge ports;

a pair of vertical substantially parallel planar aggregate deflecting wall elements disposed between and essentially perpendicular to said flat annular end plates, said wall elements opposing one another equidistantly across said axis of rotation; upper and lower aggregate deflecting means removably mounted on said upper and lower flat annular plates, respectively, within said rotatable housing, said deflecting means comprising separate flat and ramped portions; and means removably attached to said cylindrical walls for directing aggregate from said housing through said side discharge ports onto impact surfaces located outside said housing.

4,690,342

TEXTILE MACHINE FOR PRODUCING CROSS-WOUND BOBBINS

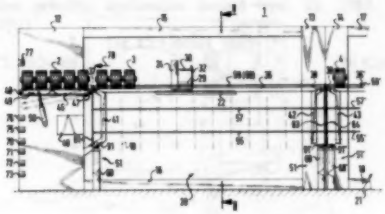
Manfred Langen, Mönchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 844,816

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1985, 3511735

Int. Cl.[4] B65H *67/06*

U.S. Cl. 242—35.5 A **6 Claims**



1. Textile machine for producing cross-wound bobbins, comprising a bobbin conveyor belt disposed along the length of the textile machine for receiving and transporting finish wound bobbins away from the textile machine, means for switching said bobbin conveyor belt on and off, a controllable bobbin depositing device, means for transferring the bobbin between said bobbin conveyor belt and said bobbin depositing device, and means for raising said bobbin depositing device for temporarily storing a row of bobbins from said conveyor belt on said bobbin depositing device with said transferring means at a distance above said bobbin conveyor belt greater than the height of the bobbins and for lowering said bobbin depositing device for returning a row of bobbins from said bobbin depositing device to said conveyor belt with said transferring means.

4,690,343

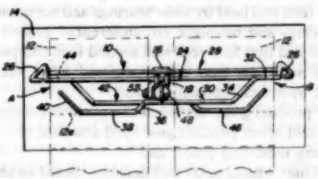
PAPER ROLL HOLDER WITH TENSION ARM

Harold E. Goetz, 1004 First, Dodge City, Kans. 67801

Filed Jan. 8, 1986, Ser. No. 817,118

Int. Cl.[4] B65H *16/04*

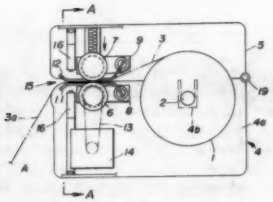
U.S. Cl. 242—55.3 **14 Claims**



1. A paper roll holder of rod material formed to provide a support arm extending cantilever-wise from a support, and a tension arm extending from one end of the support arm in juxtaposed relation to the support arm, the tension arm being bent to define a roll engaging portion parallel to the support arm and shorter in length than the support arm for resilient

deformation of the tension arm toward the support arm and gripping of a paper roll pushed onto the holder from the opposite end of the support arm, said opposite end of the support arm being formed as a headed end and the tension arm has a free terminal end portion inclined from said roll-engaging portion toward said headed end.

4,690,344
ROLL HOLDER
Mamoru Yokota, Yaizu, Japan, assignor to Yazaki Industrial Chemical Co., Ltd., Shizuoka, Japan
Filed Mar. 3, 1986, Ser. No. 835,763
Claims priority, application Japan, Feb. 18, 1986, 61-21898[U]
Int. Cl.[4] B65H *19/00, 20/02;* **B26F** *3/00*
U.S. Cl. 242—55.53 **1 Claim**



1. A roll holder for holding rotatably a roll of consecutive thin-film-like products which are separable along a break line provided between individual units of said products and for paying out a succeeding product up to a given position upon separating a product from said roll along the break line, said holder having a body and a lid openable and closeable with respect to the body via a hinge,

said body, on an inside thereof, comprising:

holding means for holding rotatably a winding core so as to hand said roll;

a first feed roll disposed in parallel with said roll and having a circumferential groove, one end of said first feed roll being supported in a bearing and another end of said first feed roll passing through a hold of a bulkhead and having a sprocket attached thereto, said sprocket being drivingly coupled via a chain to a motor;

a lower product guide arranged along said circumferential groove and attached to a mounting piece; and

a detector means, spaced a given distance from said first feed roll in a pay-out path along which said consective thin-film-like products move and stop, for detecting a succeeding product;

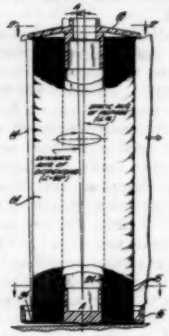
said lid, on an inside thereof, comprising:

a second feed roll held by slide bearings and accommodating springs and having a circumferential groove similarly to said first feed roll, said second feed roll pressing against said first feed roll when said lid is shut and locked by a lock mechanism; and

an upper product guide arranged at a position corresponding to said lower product guide and attached to a corresponding mounting piece; and

a control unit which, upon said detector means an absence of the succeeding product, causes said motor to rotate said first feed roll and thereby pay out the succeeding product a first distance and, upon said detector means detecting a presence of the succeeding product, causes said motor to rotate said first feed roll a certain amount in order to pay out said succeeding product a second distance.

4,690,345
PORTABLE DISPENSER FOR ROLLED PAPER PRODUCTS
John Cotey, 27 W. End Ave., Haddonfield, N.J. 08033
Filed Mar. 31, 1986, Ser. No. 846,201
Int. Cl.[4] B65H *19/00;* **B65D** *85/66*
U.S. Cl. 242—55.53 **5 Claims**

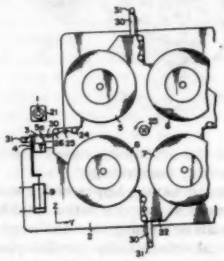


1. A portable dispenser for a roll of paper having a hollow inner core and two opposing axial ends, comprising:

a disc-like rotatable base member having an inwardly planar inner face and an upstanding retention means for firmly, non-rotatably engaging one axial end of the hollow inner core of a roll of paper, said base member having an outer face with a centrally located downward projection forming a pivot, said pivot providing means for supporting the base during rotation and an annular depending rib spaced radially outwardly of the pivot;

a cap member having an inwardly dished conical inner face and a downwardly extending rentention means for firmly, non-rotatably engaging the hollow inner core at the opposite axial end of the roll of paper, said cap member having an outer face with an upstanding projection providing means both for grasping the dispenser and for applying downward pressure on the cap member and dispenser assembly during paper sheet dispensing.

4,690,346
TAPE WINDING MACHINE
Kyoji Takeda, and Akira Kitai, both of Tokyo, Japan, assignors to Tanaka Seiki Co., Ltd., Tokyo, Japan
Filed Jan. 22, 1986, Ser. No. 821,540
Claims priority, application Japan, Jan. 25, 1985, 60-8787[U]
Int. Cl.[4] B65B *11/04*
U.S. Cl. 242—56 R **2 Claims**



1. A tape winding machine for winding an adhesive cover tape around a wound coil mounted on a rotable spindle, said

spindle having an axis extending in a first direction, comprising:

a base movable in second and third orthogonal directions, said second and third directions being perpendicular to said first direction;

a tape table rotatably supported on said base, said tape table supporting a plurality of rolls of said adhesive cover tape and being rotatable about an axis extending in said first direction;

tape mechanism means for withdrawing said cover tape from one said plurality of rolls of tape, said means including

a plurality of arms extending from said tape table, one of said arms being associated with each of said rolls of cover tape;

an axle secured to the end of each of said arms, each of said axles being rotatable about an axis extending in said first direction; and

at least one roller rotatable about an axis extending in said first direction interposed between said axle and its associated roll of cover tape, the end of a cover tape being withdrawable from a selected roll of tape and stuck to the axle associated with said selected roll of tape;

a pad supported by said base for movement in said second direction, said pad having a surface contacting said tape between said axle and said roller, the end of said tape being attached to the outer winding of said wound coil by movement of said pad in said second direction; and

a cutter supported by said base adjacent to said pad for movements in said second and third directions, said cutter being moved in said third direction to a predetermined position after the end of said tape has been attached to said wound coil and in said second direction to cut said tape.

4,690,347

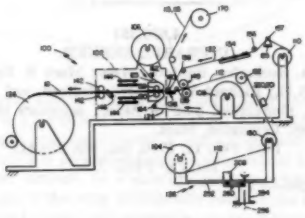
SYSTEM FOR TRANSVERSELY ALIGNING A SUBSTRATE

Frederick G. J. Grise, Osterville, Mass., assignor to Flexwatt Corporation, Canton, Mass.

Continuation of Ser. No. 478,080, Mar. 23, 1983, abandoned. This application Nov. 7, 1985, Ser. No. 796,012

Int. Cl.[4] B65H *23/032*

U.S. Cl. 242—57.1 **8 Claims**



1. A system for transversely aligning a substrate moving from a supply roll along a generally longitudinal path, said system comprising:

a first guide roll the axis of which is perpendicular to said path and generally parallel to the desired path of said substrate;

a movable guide roll intermediate said supply roll and said first guide roll, said movable guide roll being mounted such that its axis is rotatable relative to the axis of said first guide roll in a plane parallel to the axis of said first guide roll about an axis of rotation perpendicular to the axis of said first guide roll,

a sensor intermediate said movable guide roll and said first guide roll for sensing the transverse position of substrate moving from said movable guide roll towards said first guide roll and producing a signal when the sensed transverse position of said substrate is other than a desired transverse position; and

a drive operatively connected to said mounted guide roll for rotating said movable guide roll axis about said axis of rotation in response to a said signal to shift said substrate towards said desired transverse position,

said supply roll and said movable guide roll being mounted on a support with the axes thereof parallel to and spaced from each other, and said support being rotatable about said axis of rotation.

4,690,348

APPARATUS FOR WINDING A SHEET-FORMED ARTICLE

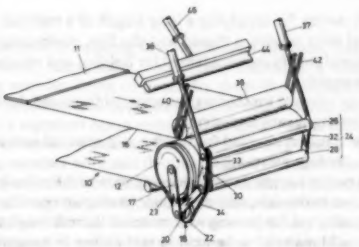
Kenji Watanabe; Hiroshi Kato, both of Aichi, and Katsunori Onishi, Shinsakae, all of Japan, assignors to Inoue Mtp Kabushiki Kaisha, Nakamura, Japan

Filed Sep. 26, 1985, Ser. No. 780,592

Claims priority, application Japan, Nov. 21, 1984, 59-177133[U]

Int. Cl.[4] B65H *18/08*

U.S. Cl. 242—66 **20 Claims**



1. An apparatus for winding a sheet-formed article, comprising:

conveyor means for transporting said sheet-formed article in an advancing-winding direction;

a takeup member, disposed adjacent to said conveyor means for forming a nip through which said sheet-formed article is to be conveyed, upon which said sheet-formed article is to be wound;

means movably disposed between a first position upon one side of said nip and at which said means is disengaged from said sheet-formed article, and a second position upon the opposite side of said nip and at which said means is engaged with said sheet-formed article for causing a free end portion of said sheet-formed article to become wrapped about said takeup member;

transmission driving means, mounted upon said conveyor means for movement with respect to said conveyor means along with said movably disposed means when said movably disposed means is moved between said first and second positions and drivingly interconnecting said movably disposed means and said conveyor means, for driving said movably disposed means, in response to the transportation drive movement of said conveyor means, in said advancing-winding direction whereby said movably disposed means can drivingly advance said free end portion of said sheet-formed article while said conveyor means can drivingly advance a remaining portion of said sheet-formed article; and

pressing means for tucking said free end portion of said sheet-formed article between said takeup member and said remaining portion of said sheet-formed article.

4,690,349

DEVICE FOR SUPPLYING A LONG LENGTH OF MATERIAL

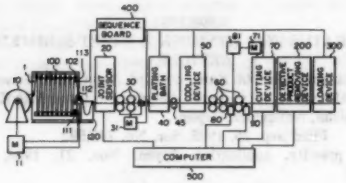
Yoshimitsu Yamaguchi, Kariya; Tadahiko Shibata, Aichi; Masanori Suzuki, and Takezi Toda, both of Kariya, all of Japan, assignors to Nippondenso Co. Ltd., Kariya, Japan

Filed Jul. 3, 1985, Ser. No. 751,730

Claims priority, application Japan, Jul. 6, 1984, 59-138969

Int. Cl.[4] B65H *16/00, 23/185*

U.S. Cl. 242—75.5 **11 Claims**



1. A device for supplying a long length of a material such as a metal strip, a wire, a thread and the like, comprising:

material supply means adapted for holding and supplying the material;

means adapted for feeding the material from said device, said feeding means including:

feed rollers adapted for passing said material into into said feeding means; and

a casing having an inlet side adjacent said feed rollers, and an outlet side, said outlet side having an opening therein adapted for passing said material therethrough to cause said material to be held in said casing in a sagging state between said inlet and outlet sides;

an accumulator disposed between said material supply means and said feeding means, said accumulator including a substantially horizontal fixed bridge, first rollers rotatably mounted on said fixed bridge each first roller rotating about a substantially horizontal axis, a substantially horizontal movable bridge disposed below said fixed bridge, and second rollers rotatably mounted on said movable bridge each second roller rotating about a substantially horizontal axis, said first and second rollers being positioned with respect to each other to cause the material supplied by said material supply means to pass alternately over said first and second rollers aand then fed to said feeding means, said movable bridge moving vertically through a first horizontal position, a second horizontal position which is located above said first position, and a third horizontal position located above said second horizontal position; and

means for controlling said material supply means and said feeding means, said controlling means including first, second, and third limit switches provided at said first, second and third positions, respectively, and a projection engagable with said first, second, and third limit switches and connected to said movable bridge, said first second and third limit switches outputting signals when said projection engages said first, second and third limit switches, respectively;

said controlling means controlling said material supply means to suspend supply of said material after said movable bridge reaches one of said first position and said third position and controlling said material supply means to supply said material after said movable bridge moves to said second position.

4,690,350

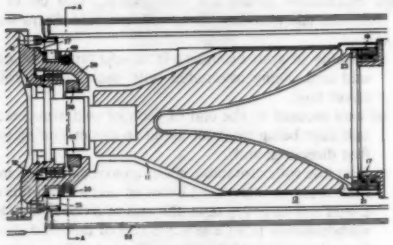
DESPINNING MECHANISM

Vincent A. Grosso, Hopkinton; Raymond J. Estlick, Winchester, and William A. Zarr, Concord, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 19, 1985, Ser. No. 811,039

Int. Cl.[4] F42B *15/02*

U.S. Cl. 244—3.1 **2 Claims**



1. In a spinning projectile carrying a shaped charge warhead, an arrangement for despinning such warhead during the terminal phase of flight of such projectile, such arrangement comprising:

(a) first means disposed between the spinning projectile and the shaped charge warhead for mounting such warhead within such projectile, the first means comprising:

(i) a pair of journal bearings disposed between the spinning projectile and the shaped charge warhead;

(ii) locking means disposed between the spinning projectile and the shaped charge warhead for inhibiting relative rotational movement between such projectile and warhead;

(b) second means for effectively increasing the moment of inertia of the shaped charge warhead whereby the speed of rotation of such warhead is reduced substantially to zero radians per unit time; and

(c) means, operative during the terminal phase of flight, for removing the locking means then to allow relative movement between the spinning projectile and the shaped charge warhead.

4,690,351

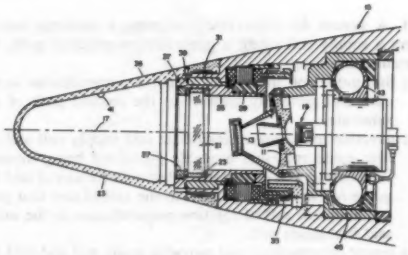
INFRARED SEEKER

Richard A. Beckerleg, Boxford, Mass.; Mark R. Fernald, Amherst, N.H.; Richard R. LaTorre, Bedford, and Vincent A. Grosso, Hopkinton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 11, 1986, Ser. No. 828,413

Int. Cl.[4] F41G *7/26*

U.S. Cl. 244—3.16 **2 Claims**



1. For use in a spinning projectile, an infrared seeker comprising:

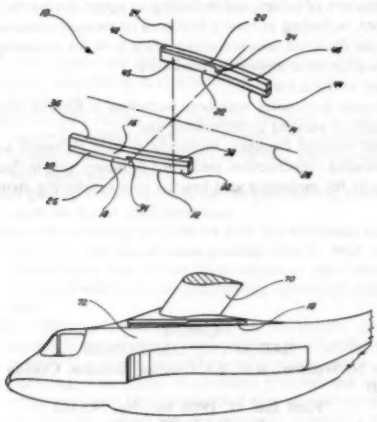
(a) an optical wedge fabricated from germanium and prestressed, such wedge serving as the entrance of a Cassegranian telescope having a small field of view;
(b) means for rotatably mounting the optical wedge about the longitudinal axis of such telescope to provide the gimbal function for the Cassegranian telescope; and
(c) means for producing a signal indicative of the orientation of the optical wedge with respect to the longitudinal axis which, when combined with an on-board spin timing measurement and I.R. detector output properly signal processed, will supply, in inertial coordinates, the time rate of change of the target's angular position without regard to the projectile's angular or positional motion to guide to intercept with the target.

4,690,352

AIRCRAFT ROTATING WING SEAL

Stephen F. Abdenour, Akron, and Stephen M. Polatas, Parma, both of Ohio, assignors to The B.F. Goodrich Company, New York, N.Y.

Filed Jul. 28, 1986, Ser. No. 890,057
Int. Cl.[4] B64C *3/56*
U.S. Cl. 249—49 **13 Claims**



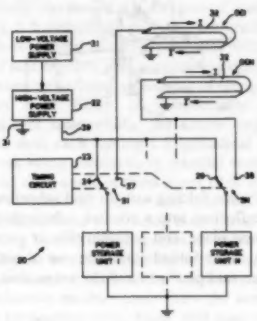
1. In an aircraft having a turntable mounted wing configured for rotation in a particular direction about a rotational axis from an inflight position wherein a longitudinal axis of the wing is substantially perpendicular to a longitudinal axis of a fuselage of the aircraft, to a stowage position wherein the longitudinal axis of the wing substantially parallels the longitudinal axis of the fuselage, and wherein a gap exists between the wing and fuselage while the wing is in the inflight position, the gap requiring sealing, a seal therefor comprising: (a) a seal element positioned to fill and seal the gap, the seal element including a pair of sections; (b) one of the sections being affixed to the fuselage, the remaining section being affixed to the wing; (c) the fuselage attached section including a forward portion and a rearward portion with respect to a direction of rotation of the wing from the inflight to the stowage position, each portion having a length, width, and thickness and the portions being separated by an inflection point; (d) the fuselage attached section forward portion having a thickness generally parallel to the rotational axis reduced by at least 1% from a corresponding thickness of the fuselage attached section rearward portion; and (e) the other section having corresponding forward and rearward portions configured to mate to the fuselage attached section portions to produce a seal having a desired thickness in a direction generally parallel to the rotation axis.

4,690,353

ELECTRO-EXPULSIVE SEPARATION SYSTEM

Leonard A. Haslim, Hayward, and Robert D. Lee, San Mateo, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 31, 1985, Ser. No. 739,792
Int. Cl.[4] B64D *15/00*
U.S. Cl. 244—134 D **27 Claims**



1. Apparatus comprising first and second opposed, flexible, ribbon-shaped, electrically conductive members, a resilient insulating member being of generally sheet-like configuration having first and second opposed surfaces, said first and second conductive members being embedded in spaced apart relationship and electrically isolated from each other in said resilient insulating member with said first and second conductive members being adjacent said first and second surfaces of said insulating member, respectively, said electrically conductive members being electrically interconnected so that any electrical current flowing in said first conductive member also flows in said second conductive member in a direction opposite to the flow in said first conductive member, said resilient insulating member having at least one void positioned between said first and second conductive members so as to facilitate separation between said first and second conductive members when electric current is routed through said conductive members and said conductive members repel each other, said void having a height less than the distance between said conductive members so that a portion of said insulating member is between said opposed conductive members.

4,690,354

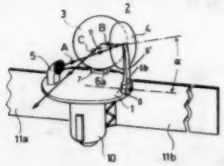
GEOSTATIONARY COMMUNICATIONS SATELLITE

Eberhard Frisch, Unterhaching, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed May 2, 1986, Ser. No. 859,147
Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516811
Int. Cl.[4] B64G *1/10*
U.S. Cl. 244—158 R **8 Claims**

1. A sun-oriented geostationary communications satellite, comprising an operational module including unfoldable solar cell arrays directable toward the sun and payload carrier means directable toward the earth, said payload carrier means having a platform (1) defining a first reference plane, antenna means, means for foldably mounting said antenna means on said platform so that said antenna means are tiltable between a folded position and an operating position, said antenna means including a main reflector (3) and a subreflector (4), both said reflectors having approximately the same size, primary radiator means (5) operatively mounted on said platform (1), said primary radiator means, said main reflector, and said subreflector being oriented relatve to each other in said operating posi-

tion so that respective beams define a second plane oriented at an angle (α) relative to said first reference plane, said angle (α) being sufficiently small for permitting folding said main reflector and said subreflector into a compact package, said mounting means comprising only one folding axis for said main reflector and only one folding axis for said subreflector for folding both said reflectors into a position substantially in parallel to said reference plane and substantially in parallel to each other, whereby in the folded condition one of said reflectors is located between said platform and the respective other reflector.



4,690,355

SOLAR ENERGY COLLECTOR

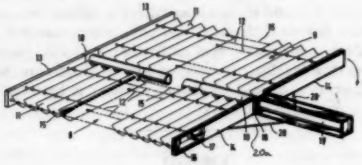
Ernst Hornung, Stuhr, and Dietrich Rex, Brunswick, both of Fed. Rep. of Germany, assignors to ERNO Raumfahrttechnik Gmbh, Bremen, Fed. Rep. of Germany

Filed Oct. 10, 1986, Ser. No. 918,285

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536290

Int. Cl.[4] H02N 6/00; B64G 1/44

U.S. Cl. 244—173 **9 Claims**



1. Solar energy collector, including a plurality of parallely arranged strip-like curved mirrors, each having on its respective concavely curved front side a reflective surface and having solar cells on the surface of its respective convexly curved rear side, upon which solar cells of another of said mirrors concentrates solar radiation, the improvement comprising:

a telescopic mast;

frame means including two transverse bars connected to said mast, said mirrors being arranged between said bars;

a plurality of cables for suspending said mirrors in said parallel arrangement between said bars, for pivoting them equally so as to change their orientation vis-a-vis a source of radiation;

operating means connected to said cables for obtaining controlling adjustment; and

two control cables connected to said mirrors for purposes of their retraction as the mast is retracted.

9. The improvement as in claim **1**, and including two said arrangements of transverse bars and mirrors extending from opposite sides of a space vehicle.

4,690,356

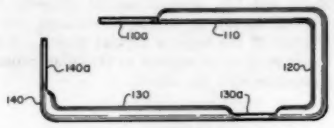
WIRE FORMED CABLE BRACKETS

James V. Koppensteiner, Chicago, and Charles K. Kubik, Brookfield, both of Ill., assignors to GTE Communication Systems Corporation, Northlake, Ill.

Filed Dec. 30, 1985, Ser. No. 814,702

Int. Cl.[4] F16L 3/22

U.S. Cl. 248—68.1 **1 Claim**



1. A bracket for use in an environment including cables and a supporting structure,

said bracket comprising a flexible material formed into an enclosure through which cables are inserted, whereby said flexible bracket causes said cables to be grouped together;

said bracket formed from wire, at least partially enclosing a pluraity of cables, and including an upper horizontal member, including at least a first area of swaged construction, said flattened area including a first hole for mounting said bracket to a supporting structure;

a left vertical member;

a lower horizontal member, including a second flattened area of swaged construction; and

a left vertical member, including a third flattened area of swaged construction, said third flattened area including a hole for mounting said bracket to a supporting structure.

4,690,357

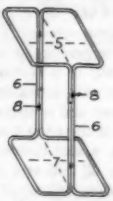
BAG STAND CONTAINER

James N. Webster, R.R. #3, Dundas, Ontario, Canada (L9H 5E3)

Filed Jun. 11, 1985, Ser. No. 743,413

Int. Cl.[4] B65B 67/04

U.S. Cl. 248—99 **8 Claims**



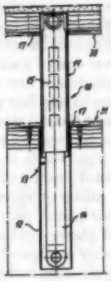
1. A two legged bag stand capable of supporting an open top plastic or cloth bag; said stand comprising two closed U-shaped sections, each U-shaped section consisting of a series of eight straight sections, the ends of which are connected to each other by eight bends of approximately 90°, and means mechanically attaching said U-shaped sections back to back to make a bag stand frame having a top frame portion defining a top generally rectangular opening over which the top of an open bag may be attached, a similarly shaped bottom frame portion resting on the floor, and two vertically support members extending between said top and bottom frame portions.

4,690,358

HEIGHT-ADJUSTABLE FITTING FOR FURNITURE

Franz Horenkamp, Bielefeld, Fed. Rep. of Germany, assignor to Ferdinand Lusch GmbH & Co. KG, Bielefeld, Fed. Rep. of Germany

Filed Mar. 13, 1986, Ser. No. 839,135
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 8507806[U]
Int. Cl.[4] E04G 3/00
U.S. Cl. 248—297.3 3 Claims



1. An adjustment fitting for a height-adjustable furniture furniture, comprising in combination

a guiding sleeve;

an elongated carrier post partially received in said guiding sleeve for shifting therein and defining a longitudinal axis;

a furniture part connected to one of said guiding sleeve and said elongated carrier,

said guiding sleeve and said carrier post having non-circular cross-sectional configurations;

means for arresting said carrier post in a multitude of shifted positions relative to said guiding sleeve, said arresting means being free of any lever means or pawl means and arranged within one of said guiding sleeve said and carrier post,

said arresting means including an outwardly projecting pocket in said guiding sleeve, said pocket having a downwardly tapering wedge-like configuration, and

a clamping roller made of synthetic material and extending transversely to the longitudinal axis of said carrier post, received in said pocket, and normally exerting a wedging effect,

whereby an independent descent of the furniture part under its own weight is prevented by said wedging effect, but said wedging effect may be overcome by exerting a certain predetermined force onto said furniture part, so that said furniture part may be brought into a rest position.

4,690,359

TAKE-UP BRACKET FOR FLOORING ADJUSTMENT

Randall L. Phillips, 8004 Belleview, Kansas City, Mo. 64114

Filed May 1, 1986, Ser. No. 858,383
Int. Cl.[4] A47F 5/00
U.S. Cl. 248—300 4 Claims

1. An adjustment bracket adapted for operative connection to a supporting joist or rafter and an overlying supported section in order to move the supported section towards or away from the joist or rafter as desired, said bracket comprising:

an elongated, integral metallic body of generally L-shaped cross section and presenting a longitudinal axis, said body including

an elongated section-engaging leg and an elongated support-engaging leg, said section-engaging leg including structure defining a plurality of elongated first slots therein each being of substantially constant width throughout essentially the entire length thereof, said first slots each having a longitudinal axis, the longitudinal axes of said first slots being substantially parallel with the longitudinal axis of said bracket, said support-engaging leg also including structure defining a plurality of elongated second slots therein each being of substantially constant width throughout substantially the entire length thereof, said second slots each having a longitudinal axis, said second slot axes being substantially parallel with each other and oriented at an angle of from about 10 to 30 degrees relative to the longitudinal axis of said bracket,

said first and second slots being configured and arranged for receiving therethrough screws or other fasteners affixed to said joist or rafter and said section, and for permitting selective axial shifting of the bracket in either axial direction whereby to alternately draw the section closer to, or move the section away from, said joist or rafter; and

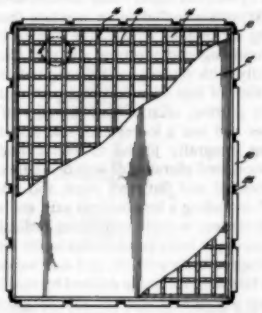
structure defining at least one fastener-receiving set hole through each of said legs and separate from said slots for securing said bracket in operative disposition in engagement with said section and support after said shifting of said bracket.

4,690,360

CARGO PALLET

Robert Looker, Carpenteria, Calif., assignor to Satco, Inc., El Segundo, Calif.

Filed Apr. 16, 1985, Ser. No. 723,881
Int. Cl.[4] A47B 91/00
U.S. Cl. 248—346 9 Claims



1. A cargo pallet comprising:

a. a rectangularly shaped core comprising a grid of a plurality of stringers and struts, said stringers and struts creating a cross-hatch assembly in which said stringers are elongate members extending from one edge of said core to the other edge of said core, and said struts are cross members between said stringers, said stringers and said struts also having at least one cross-sectional portion thereof in substantially a C-shape such that a flat surface is presented on either side thereof;

b. a first aluminum sheet rigidly attached to said flat surface on said stringers and struts on one side of said core, said first aluminum sheet sized and shaped to substantially cover said core; and

c. A second aluminum sheet rigidly attached to the other said flat surface on said stringers and struts on the second side of said core, said second aluminum sheet sized and shaped to substantially cover the second side of said core.

4,690,361

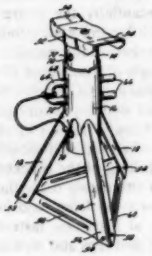
JACK STAND AND METHOD FOR MAKING A JACK STAND

Philip L. Lundman, 400 Wheeler Rd., Fredonia, Wis. 53021

Continuation-in-part of Ser. No. 682,610, Dec. 17, 1984, abandoned, which is a division of Ser. No. 455,013, Jan. 3, 1983, abandoned. This application Apr. 15, 1986, Ser. No. 852,234

Int. Cl.[4] E04G *25/00*

U.S. Cl. 248—352 **1 Claim**



1. A jack stand of the type for use in supporting a vehicle, the jack stand comprising:

a base portion including,

a generally cylindrical upper body portion including a central cylindrical chamber and a central longitudinal axis, said cylindrical upper body portion being formed from a first portion of a flat steel plate bent around said longitudinal axis so as to form a cylinder, said flat steel plate including lateral edges welded together to form a vertical linear welded seam parallel to said central longitudinal axis of said cylindrical upper body portion, said cylindrical upper body portion including an aperture therein, said aperture being surrounded by a flange formed by extruding metal surrounding said aperture, and said flange extending outwardly with respect to said longitudinal axis,

a plurality of legs adapted to support said cylindrical upper body portion, each of said plurality of legs including an upper end and a lower end, said upper ends of said legs being integrally joined to said cylindrical upper body portion, said plurality of legs being formed from a second portion of said flat steel plate, and said plurality of legs each including a longitudinal axis, and said legs diverging with respect to said central longitudinal axis of said cylindrical upper body portion and in the direction away from said upper body portion, and said welded seam defining a line bisecting the angle defined by said longitudinal axis of a first one of said legs and said longitudinal axis of a second one of said legs, and each of said legs being bent about a bend line parallel to said longitudinal axis so as to include a first elongated planar leg portion and a second elongated planar leg portion joined at said bend line, said first elongated planar leg portion and said second elongated planar leg portion defining an angle therebetween of substantially 60°, and the lower end of the first elongated planar leg portion of a first one of said legs being coplanar with the lower end of a second elongated planar leg portion of a second one of said legs, and the second elongated planar leg portion of said first one of said legs including a portion coplanar with a portion of the first elongated planar leg portion of a third one of said legs and the first elongated planar leg portion of the second one of the legs including a portion coplanar with a portion of the second elongated planar leg portion of said third one of said legs, and said bend line formed between said first elongated planar leg portion and said second elongated planar leg portion of at least one of said legs extending into said cylindrical upper body portion, and

brace means for fixedly joining said lower ends of said legs together in spaced apart relation, said brace means including a one piece triangular brace member, said triangular brace member including a first corner engaging said lower end of one of said legs, said first corner including a first planar portion welded in face to face relation to said lower end of the first elongated planar leg portion of said first one of said legs and a second planar portion welded in face to face relation to said lower end of the second elongated planar leg portion of said one of said legs, a second corner engaging said lower end of a second one of said legs, said second corner including a first planar portion welded in face to face relation to said first planar portion of a second one of said legs and a second planar portion welded in face to face relation to said second planar portion of said second one of said legs, and a third corner engaging said lower end of a third one of said legs, said third corner including a first planar portion welded in face to face relation to said first planar portion of a third one of said legs and a second planar portion welded in face to face relation to said planar portion of said third one of said legs,

a vehicle supporting member including a cylindrical portion housed in said generally cylindrical upper body portion in telescoping relation and having an upper end adapted to support a vehicle, said cylindrical portion of said vehicle supporting member including an aperture therein, said aperture being surrounded by a flange, said flange extending inwardly with respect to said longitudinal axis and being formed by extruding metal surrounding said aperture inwardly with respect to said longitudinal axis,

pin means extending through said apertures in said cylindrical upper body portion and in said cylindrical portion of said vehicle supporting member.

4,690,362

ADJUSTABLE STAND FOR A VISUAL DISPLAY UNIT

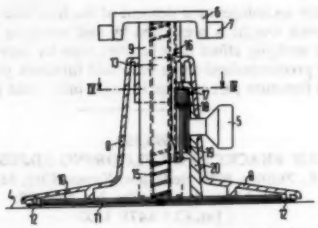
Olav Helgeland, Nittedal, Norway, assignor to Tangberg Data A/S, Oslo, Norway

Filed Jun. 5, 1985, Ser. No. 741,353

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423549

Int. Cl.[4] A47G *29/00*

U.S. Cl. 248—404 **10 Claims**



1. An adjustable height stand for a visual display unit comprising a base part disposed on a work surface, and a support part capable of being moved relative to said base part, said support part having a column and a bearing bracket connected to said column for securing and supporting said visual display unit, and adjustment means interconnected between said base part and said support part, comprising a helical drive gear connected to said base part and spaced from the side of said column and axially aligned with the displacement direction of the column, a second gear cooperating with said helical drive gear, said second gear comprising an externally directed fe-

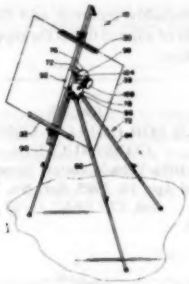
male thread connected to said column and arranged parallel thereto, side by side with said drive gear, whereby said column is moved longitudinally in response to rotation of said drive gear, and a spring interposed between said base part and said support part within said column for compensating for the weight of said visual display unit.

4,690,363

CANVAS CARRIER

Thomas Koves, 431 S. Burnside Ave., #2C, Los Angeles, Calif. 90036

Filed Aug. 29, 1986, Ser. No. 901,743
Int. Cl.[4] A47B 97/04
U.S. Cl. 248—449 **10 Claims**



1. In combination:

a central spine, said central spine having a substantially uniform exterior cross section;

a manually engageable handle on said central spine for manual grasp;

first and second cross members on said central spine, each of said first and second cross members being mounted on said central spine, each of said adjustable cross members having a collar thereon which embraces said spine, means on said collar for locking said collar at a selected position on said spine;

means on each of said first and second cross members for engagement on an artist's canvas panel so that said means on said cross member can grasp an artist's canvas panel to be carried by said manually graspable handle, each of said cross rails having first and second channels therein, said first channel having sufficient width to engage on the edge of a panel of first thickness and said second channel having a width suitable to engage on the edge of a panel of second thickness;

a tripod, said tripod having a head and having three legs pivotally mounted to said head, said tripod head having a transverse pivot axis, said tripod head being substantially upright disc with said axis substantially through the center of said disc, an arcuate slot through said disc around said axis, a control unit engaging said central spine and said tripod head, and a clamp engaging said control unit and extending through said arcuate slot to clamp said control unit at a selected angle with respect to said disc on said tripod head.

4,690,364

WHEELCHAIR RESTRAINING DEVICE

Bruce J. Constantin, 7575 E. Industrial, Baton Rouge, La. 70805

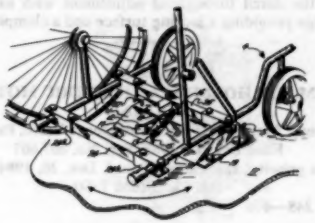
Filed Apr. 14, 1986, Ser. No. 851,972
Int. Cl.[4] A47B 97/00
U.S. Cl. 248—503.1 **4 Claims**

1. An apparatus for restraining a wheelchair inside a moving vehicle comprising:

(a) attaching assembly comprising:

(i) a base member fixed to the underside of said wheelchair, said base member comprising a tubular member having end pieces extendable and attachable to the parallel runners attached to wheelchair frame members underneath the seat of said wheelchair, said end pieces comprising a tubular section concentric whith said tubular member and shaped to slide along and extend beyond said tubular member, and

(ii) a vertical member perpendicularly attached to said base member and extending downward; and



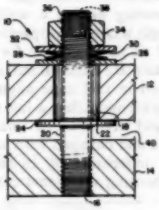
(b) a single locking assembly fixedly mounted to a predetermined position on the floor of said moving vehicle comprising a single locking means to receive and lock to said vertical member by means to allow rotation of said vertical member while locked by said single locking means, said locking means being attached to the inside of a housing fixedly mounted to said floor, said housing having a guide channel extending along and through its top surface to receive said vertical member and position it within the locking members of said locking means.

4,690,365

JACK STUD

John Miller, Huntington Station; Richard O. Barton, Levitown, and Oscar H. Schaefer, Massapequa Park, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed May 16, 1986, Ser. No. 863,896
Int. Cl.[4] F16M 13/00
U.S. Cl. 248—650 **12 Claims**



1. A clamping device for setting a detail which has at least one oversized throughbore to a fixture base which has at least one threaded throughbore, said clamping device having six degrees of freedom, comprising:

(a) a longitudinally adjustable body portion having an upper portion and a lower portion and being fixed in space so as to form a firm point for longitudinal rotation so that bending of said body portion is eliminated during setting;

(b) an integral flange disposed on said body portion and separating said upper portion from said lower portion; and

(c) clamping means including two Belleville spring washers disposed intermediate two standard washers under a standard hexagonal nut, said clamping means being disposed on said upper portion of said body portion and providing single load line jacking and clamping to adjust and hold the detail in position with relation to the fixture base while

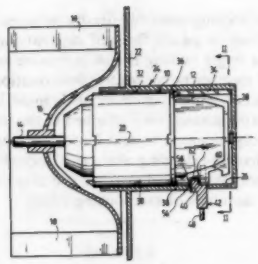
preventing lock-up of the clamping device and the detail as the detail traverses the six degrees of freedom, said clamping means and the oversized throughbore in the detail allow the detail to traverse the six degrees of freedom, said clamping means captivating the detail being set without constantly tightening or loosening said standard hexagonal nut as the detail is being adjusted into position both linearly and angularly, said clamping means turning with said body portion during adjustment and forming an integral unit so as to keep a continual clamping pressure on the detail throughout adjustment with said integral flange providing a jacking surface and a clamping surface.

4,690,366

SYSTEM FOR HOLDING AN ELECTRIC MOTOR IN A HOUSING

Didier Loup, Maurepas, France, assignor to Valeo, Paris, France

Filed Dec. 11, 1985, Ser. No. 807,607
Claims priority, application France, Dec. 20, 1984, 84 19578
Int. Cl.[4] F16M *1/00*
U.S. Cl. 248—676 **11 Claims**



1. A system for retaining an electric motor in a housing against withdrawal therefrom, said system comprising said motor including a cage supporting the stator and guiding the motor shaft, said motor further including two tabs, the housing including a motor-receiving open end and centering and abutment means cooperating with said cage and slidably receiving and positioning the motor within the housing through said open end, said housing having a wall including an orifice defined therethrough, a connector passing through said orifice and being engaged on said two tabs for feeding electricity to the motor, which tabs are fixed on said cage within said housing; a notch defined in said cage aligned with said housing orifice, said connector including a lug received through said orifice and into said notch when said connector is passed through said orifice and engaged with said tabs, said lug comprising a member independently of said tabs retaining the motor within the housing when said connector is engaged.

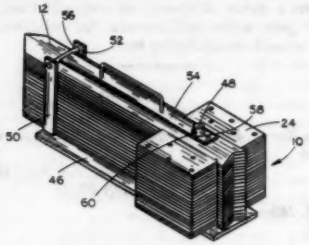
4,690,367

WOOD-FORM SPLICE STAKE AND CARRIER

Beryl D. Weathers, Box 72, Holmesville, Nebr. 68374

Filed Jan. 6, 1986, Ser. No. 816,322
Int. Cl.[4] E01C *7/00*
U.S. Cl. 249—6 **8 Claims**

1. A wood-form splice stake, comprising,
an elongated stake member having front and back sides and upper and lower ends, said lower end being adapted to be driven into the ground,
a pair of generally flat flanges rigidly mounted on said stake member adjacent the upper end thereof,
said flanges extending laterally outwardly from said stake member in opposite directions,
said flanges having respective front surfaces lying in a common plane, said stake member being positioned in nonintersecting relation with respect to said common plane,
said stake member having a cross-sectional shape such that a plurality of stake members may be stacked front surface to back surface in nested relation, and



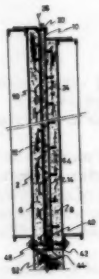
means for detachably securing said flanges to respective adjacent ends of aligned forms for supporting said forms in aligned relation.

4,690,368

APPARATUS FOR HOLLOW CONCRETE WALL CONSTRUCTION

Naftali Heiman, 105a Yehuda Halevi Street, Tel-Aviv, Israel

Filed Apr. 16, 1985, Ser. No. 723,833
Int. Cl.[4] E04G *11/08*
U.S. Cl. 249—37 **9 Claims**



1. Apparatus for use in constructing hollow concrete walls including a pair of vertical mold plates; a spacer core to be introduced from the lower end of the core and spaced from the pair of vertical mold plates before casting wet concrete, and to be subsequently removed after initial setting of the concrete, said spacer core having a width of at least an order of magnitude greater than its thickness, only the lower end of said spacer core including a water permeable wall and a bottom chamber for accumulating water permeating said wall; and means for spacing the spacer core from the vertical mold plates when introduced therebetween.

4,690,369

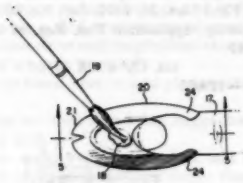
FORM FOR PREPARING ARTIFICIAL NAILS

James T. Giuliano, Ft. Lauderdale, Fla., assignor to Zotos International, Inc., Darien, Conn.

Division of Ser. No. 522,536, Aug. 12, 1983. This application Mar. 27, 1986, Ser. No. 844,530
Int. Cl.[4] A45D *31/00*; B29C *41/38*
U.S. Cl. 249—55 **12 Claims**

1. A mold form for use in preparing artificial nails, comprising a flexible liquid-impermeable sheet material having a leading end, a trailing end and opposed lateral edges, said trailing end being generally arcuate for placement under a tip of a natural nail of a digit, said sheet material having means defining a well in the shape of a desired artificial nail, said well defining

means comprising a continuous upstanding wall extending from said trailing end towards said leading end intermediate said lateral edges and said leading end, said well being of the



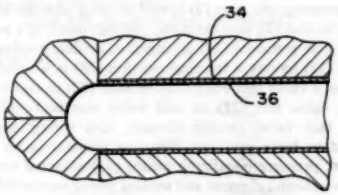
general configuration of the desired artificial nail tip and being adapted for receiving a liquid artificial nail coating composition.

4,690,370

RHODIUM COATED MOLD

James R. Skinner, Saratoga, Calif., assignor to M. U. Engineering & Manufacturing, Inc., Mountain View, Calif.

Filed Sep. 29, 1982, Ser. No. 427,717
Int. Cl.⁴ B29C *33/56*
U.S. Cl. 249—114 R **5 Claims**



1. In a mold (24) useful for preparing a molded plastic article (10), the mold (24) having a mold surface (30) having a surface portion (32) which is replicated onto the molded plastic article (10), an improvement comprising:

wherein said surface portion (32) has a surface roughness of no more than about 12.5×10^{-8} meters, RMS; and including

a surface coating (34) comprising rhodium covering said surface portion (32), said coating (34) being substantially void-free, substantially noncorroding when exposed to ambient atmospheric conditions, having a Rockwell C hardness above about 60 and having a surface roughness of no more than about 12.5×10^{-8} meters, RMS.

4,690,371

ELECTROMAGNETIC VALVE WITH PERMANENT MAGNET ARMATURE

Robert W. Bosley, Cerritos; Samson Kirshman, San Jose; Dan B. LeMay, Palos Verdes Estates, and Wayne G. Renken, San Jose, all of Calif., assignors to Innovus, San Jose, Calif.

Filed Oct. 22, 1985, Ser. No. 790,279
Int. Cl.⁴ F16K *31/08*
U.S. Cl. 251—65 **13 Claims**

1. A modulating valve comprising:

a flow orifice having an orifice seat;

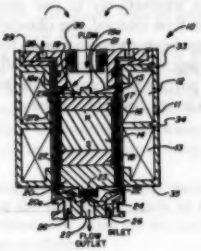
an armature assembly including a valve seal on an axial end of said armature assembly, said valve seal being axially oriented with respect to said orifice seat;

at least one annular solenoid coil;

said armature assembly including a cylindrical armature housing confined within an annulus formed by said at least one annular solenoid coil and moveable axially with respect to said at least one annular solenoid coil to any displaced selected position between a full open and close position of said valve seal and said orifice seat;

a permanent magnet fixedly mounted in said cylindrical armature housing axially within said annulus of said at least one annular solenoid coil;

further including a first magnetically inert cylindrical housing extending interiorly of said at least one annular solenoid coil;



a second magnetically inert cylindrica housing annularly spaced interiorly of said first magnetically inert cylindrical housing forming a first flow passage therebetween;

said cylindrical armature housing having an outer peripheral surface annularly spaced from said second magneticcally inert cylindrical housing forming a second flow passage therebetween; and

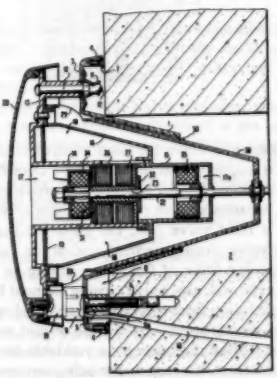
wherein said permanent magnet and said at least one annular solenoid coil are remote from said first and second flow passages.

4,690,372

AUTOMATIC REGULATING VALVE OF THE AIR FLOW SUCKED OUT OF A ROOM THROUGH A MECHANICAL VENTILATING INSTALLATION

Marius Thiebaud, 301, Route de Suisse, CH-1298 Celigny, Switzerland

Filed Jun. 13, 1986, Ser. No. 874,034
Claims priority, application Switzerland, Jul. 1, 1985, 02800/85
Int. Cl.⁴ F16K *31/08*
U.S. Cl. 251—129.1 **7 Claims**



1. Automatic regulating valve of the air flow sucked out from a room through a mechanical ventilation installation comprising a channel to suck air the cross-section of which depends on the position of an obturating member subjected to

the action of an acuating device itself controlled by a control device, the actuating device of the obturation member comprising a shaft sliding axially in a portion of the body of the valve, one end of which is fast with the obturation member, two permanent magnets carried by said shaft and separated the one from the other by a distance defining the variation of the cross-section of the passage of the air channel; at least one coil fixed in said valve between said magents to create a magnetic field, said control device having means to feed this coil with a direct current alternatively in one and the other direction during a given time interval, the obturation member comprising a membrane having a bottom and a frustoconical rigid wall, the bottom being connected to said shaft, the periphery of the frustoconical portion being connected through a flexible membrane portion to the body of the valve.

4,690,373

MAGNETIC VALVE FOR FLUID CONTROL

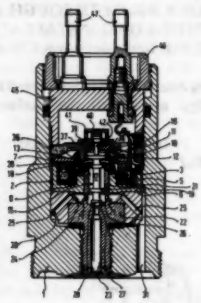
Ernst Linder, Mühlacker; Helmut Rembold; Max Straubel, both of Stuttgart, and Walter Teegen, Waiblingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 24, 1985, Ser. No. 779,723

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442750

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.02 **6 Claims**



1. A magnetic valve for fluid control comprising a valve housing, a magnetic coil mounted on a core of ferromagnetic material disposed in said housing and provided with an armature that actuates a valve closing element arranged to cooperate with a fixed valve seat, the armature being arranged to press the valve closing element against the valve seat counter to an opposing force of fluid flow during an excited state of said magnetic coil, said valve closing element being lifted in an opening direction from the valve seat by said opposing force of fluid flow during an unexcited state of said magnetic coil and limited in a lifted direction by a yieldable stop means spaced axially therefrom, the stop means being arranged to yield in the opening direction of the valve closing element, and the valve closing element is adapted to lift a variable distance off the valve seat thereby increasing a free flow cross section at the valve seat as a function of fluid pressure applied by said opposing force of fluid flow acting thereon.

4,690,374

MAGNETIC VALVE FOR FLUID CONTROL

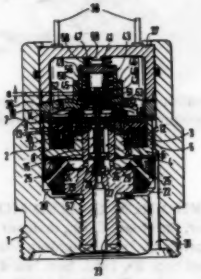
Wilhelm Polach, Möglingen, and Helmut Rembold, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 26, 1985, Ser. No. 801,710

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1985, 3500449

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.02 **9 Claims**



1. A magnetic valve for fluid control comprising, a housing (1), a ferromagnetic core (2) in said housing adapted to receive a magnetic coil (3), said magnetic coil surrounding a portion of said core, an armature (10) arranged to actuate a valve closing element (15) having a terminal portion (28) in a valve closing direction, a valve seat body (22), an inlet (23) in said valve seat body, a valve seat (27) on said valve seat body adapted to receive said valve closing element, first spring means (35) arranged to force said valve closing element in an opening direction, pressure equalizing means (43) adjacent one end of said valve closing element and second spring means (56) associated with said pressure equalizing means and a collar (41) on said valve closing element, whereby upon excitation of said magnetic coil to close said valve closing element, pressure from said inlet exerts an increasing pressure on to said pressure equalizing means which exerts a force on said second spring means which exerts a force upon said valve closing element to urge said valve closing member in an opening direction in a delayed manner prior to deenergization of said magnetic coil, and subsequent to deenergization of said magnetic coil, said first and second spring exerts a force on said closing element to cause said closing element to quickly rise.

4,690,375

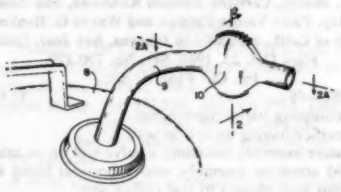
SELF CLOSING SQUEEZE VALVE

Daniel J. Vorhis, P.O. Box 4183, Seattle, Wash. 98104

Filed Jul. 7, 1986, Ser. No. 882,837

Int. Cl.[4] F16K *31/00*; B65D *5/72*

U.S. Cl. 251—342 **4 Claims**



1. A self-closing squeeze valve comprising:
a body,
at least one resilient and deformable wafer,
said body being resilient and deformable and having:

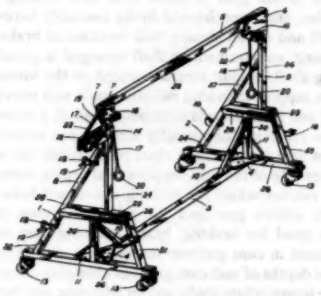
a longitudinal axis,
an inlet port,
an internal cavity,
an outlet port,
said inlet port, said cavity and said outlet port being interconnected to form a passage through said body,
said passage having a first cross sectional area in a plane essentially transverse to said longitudinal axis of said body as formed and when at rest, and
a second cross sectional area in said plane with said body deformed
said second cross sectional area being larger than said first cross sectional area,
said at least one wafer being inserted in said cavity and having a third cross sectional area larger than said first cross sectional area and smaller than said second cross sectional area, whereby, with said at least one wafer inserted into said cavity, said body is deformed to adapt said first cross sectional area to essentially equal said third cross sectional area to close said passage, and, when
said body and wafer are further deformed, such as by finger pressure applied by an operator, said passage is deformed to said second cross sectional area such that said passageway opened.

4,690,376

MAT TRANSPORT RACK

Neil Duncan, North Babylon, N.Y., assignor to Olympia Sports Products, Inc., Plainview, N.Y.

Filed Apr. 16, 1986, Ser. No. 852,417
Int. Cl.[4] B66D *3/12, 3/26*
U.S. Cl. 254—327 **1 Claim**



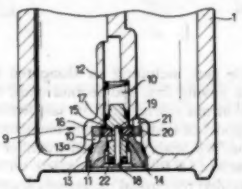
1. A transport rack for storing and transporting a three section wrestling mat comprising:
a first upright frame and a second upright frame connected in parallel by an upper hollow horizontal beam and a lower horizontal beam; the horizontal beams being substantially perpendicular to the frames and having a length greater than the length of a rolled mat section;
the frames having a long inclined member having storage locations for two rolled mat sections and a short inclined member having a storage location for one rolled mat section, the long inclined member being at least twice the length of the short inclined member, the frames being positioned and configured so that the long inclined members define a first inclined lifting plane and the short inclined members define a second inclined lifting plane;
the inclined members having a plurality of support means for engaging a cylindrical member extending from the rolled mat section, two support means positioned along the length of each of the long inclined members so as to define a first upper storage location for a rolled mat section and a second lower storage location for a rolled mat section along the first lifting plane, one support means positioned along the length of each of the short inclined members so as to define a third storage location along the second lifting plane at substantially the same level as the second storage location;
the first frame having a winch means mounted thereon, the winch means being connected to a short cable and a long cable, each cable terminating in a hook means for engaging the cylindrical members extending from the rolled mat sections;
the short cable being mounted on a first pulley means positioned adjacent to the first frame and thereafter extending downwardly between two guide pulleys attached to the first frame along the first frame;
the long cable being mounted on a second pulley means coupled to the first pulley means and thereafter extending through the upper horizontal beam and being mounted on a third pulley means positioned adjacent to the second frame and extending downwardly between two guide pulleys attached to the second frame along the second frame;
the winch means being operable to lift mat sections coupled to the cables along the first lifting plane to the first and second storage positions and along the second lifting plane to the third storage position.

4,690,377

HIGH-PRESSURE GAS FILLING VALVE FOR USE IN A PRESSURE RESISTANT CONTAINER

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Kanagawa, Japan

Filed Dec. 29, 1986, Ser. No. 947,444
Claims priority, application Japan, Mar. 18, 1986, 61-38341[U]
Int. Cl.[4] F16K *31/00*
U.S. Cl. 251—354 **1 Claim**



1. A gas filling valve for use in a pressure resistant container comprising:
a reentrant valve chamber opening to the atmosphere at one end thereof and communicating with the inside space of the pressure resistant container at the other end of said valve chamber;
a slidable valve body put in the valve chamber, said valve body having a neck or reduced diameter, a gas injection path opening to the atmosphere and extending short of the top of the valve body along the longitudinal central axis thereof, and valve outlet radially branching from the longitudinal gas injection path;
a spring means for pushing the slidable valve body towards the open end of the valve chamber;
a valve fitting fixed to the valve chamber, accommodating said slidable valve body in the center hole or the valve fitting;
an annular seat integrally connected to and inwardly projecting from the top perimeter of the valve chamber wall in opposing relation to the top end of the valve fitting, leaving a given space therebetween; and
a seal ring of an elastic material slidably fitted around the neck of the valve body, said seal ring being movable between the annular seat and the top end of the valve fitting in said given space, and being pushed against the top end of the valve fitting under the influence of said

spring means in the stand-by position, said valve body being normally in the stand-by position in which its valve outlet is closed by the inner peripheral surface of said seal ring, and the valve outlet being brought above said seal ring in the gas-filling position in which said slidable valve body is pushed upward against said spring means; characterized in that said gas filling valve further comprises:

a control ring sandwiched between the top end of said valve fitting and said annular seat, encircling said seal ring in said valve chamber; and

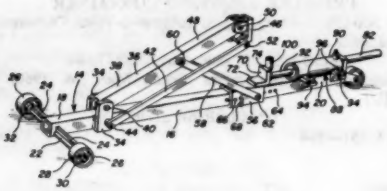
gas depletion path extending from the place at which the top surface of said control ring is in contact with said annular seat to the atmosphere through the space between said control ring and the inner wall of said valve chamber and the space between said control ring and the top end of said valve fitting.

4,690,378

VEHICLE JACK

Davis R. Jarman, Hortense, and Virgil H. Hinson, Brunswick, both of Ga., assignors to Automotive Collision Tools, Inc., Brunswick, Ga.

Filed Feb. 24, 1986, Ser. No. 832,060
Int. Cl.[4] B60P *1/48*
U.S. Cl. 254—8 B **11 Claims**



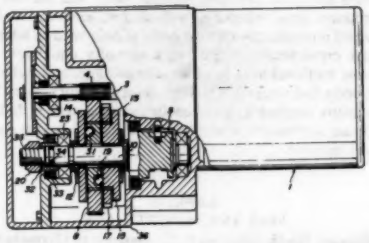
1. A vehicle jack including an elongated horizontal main beam member having first and second ends, first and second support wheel means journalled from said first and second ends for rolling support of said main beam member from a horizontal support surface with said beam member slightly spaced above said surface, a follower mounted on said main beam member for guided reciprocal movement longitudinally therealong generally centrally intermediate said ends, upper and lower, elongated and parallel lift arm means including corresponding first and second ends, means pivotally mounting said first ends from said first end of said beam member for angular displacement relative thereto about first horizontal upper and lower axes, respectively, extending transversely of said beam member and lift arm means, an upright support, means pivotally securing the second ends of said upper and lower lift arm means to upper and lower portions, respectively, of said upright support for relative angular displacement of said upright support and upper and lower arm means about second horizontal upper and lower axes, elongated thrust arm means including first and second ends pivotally secured to a longitudinal midportion of said upper lift arm means and said follower, respectively, for angular displacement relative thereto about axes paralleling said first and second upper and lower axes, anchor means carried by said follower and projecting upwardly therefrom to an elevation spaced above said beam member, and elongated, longitudinally extendable fluid motor means carried by and extending along said beam member second end on the side of said follower remote from said first end of said beam member and including a mounted base portion anchored relative to said beam member and an extendable portion engaged with said anchor means to force said anchor means and follower along said beam member toward said first end of said beam member responsive to longitudinal extension of said fluid motor, said beam member comprising a tubular member and said follower comprising a sleeve slidably mounted on said tube member, and a latch means including selectively registerable transverse bores in and spaced longitudinally of said tube and follower sleeve and a pin removably receivable through selectively registered bores.

4,690,379

ELECTRIC CHAIN BLOCK

Takayoshi Nakamura, Nakakoma, Japan, assignor to Kabushiki Kaisha Kito, Yamanashi, Japan

Filed Feb. 26, 1986, Ser. No. 832,788
Claims priority, application Japan, Feb. 27, 1985, 60-36500
Int. Cl.[4] B66D *3/20, 5/22*
U.S. Cl. 254—347 **7 Claims**



1. An electric chain block including a driving shaft connected to a rotating shaft of an electric motor, and a driving gear provided on the driving shaft, and further including an intermediate driven gear in mesh with said driving gear, a torque limiter, and a mechanical brake assembly between the driving shaft and a load sheave, said mechanical brake assembly comprising: an intermediate shaft arranged in parallel with said driving shaft, urging means coupled to the intermediate shaft, a cam support provided radially inside said intermediate driven gear and fitted on said intermediate shaft, a retainer disc and a brake receiving disc axially slidably but non-rotatably mounted on said intermediate shaft respectively on one side and the other side of the cam support, said urging means being a spring, a ratchet wheel for braking interposed between the intermediate driven gear and the brake receiving disc and engaging a pawl for braking, brake releasing cam members accommodated in cam grooves formed in a side of said cam support, the depths of said cam grooves changing circumferentially of the intermediate shaft, and an adjusting nut threadedly engaging an extending end of said intermediate shaft for adjusting the urging force of said urging means.

4,690,380

SHEAVE ASSEMBLY WITH MULTIPLE PULLEYS USED TO MEASURE CABLE ANGLE

Shale J. Niskin, Miami Beach, and Gerald J. Williams, Dade County, both of Fla., assignors to General Oceanics, Inc., Miami, Fla.

Filed Jan. 30, 1986, Ser. No. 824,243
Int. Cl.[4] B66D *3/06;* G01L *5/08*
U.S. Cl. 254—394 **8 Claims**

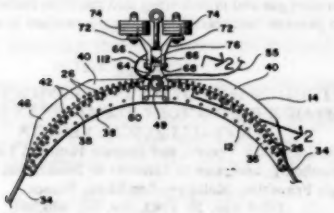
1. In a counter-balanced sheave assembly for supporting a cable having a tension applied thereto and which extends downward from said sheave assembly so as to define a cable angle, said sheave assembly having a support frame; a plurality of sheaves rotatably mounted to said support frame along a downwardly facing, arcuate path the improvement comprising:

means for measuring downward force on said sheave assembly and for generating a force signal indicative of said downward force;

a plurality of sensors, each one disposed to detect rotation of one of said sheaves and for generating rotation signals

indicative of said rotation for each said sheave for which rotation is sensed;

means for determining said angle of said cable from said



rotation signals and for generating an angle signal indicative of said angle; and

means for determining said tension applied to said cable from said force signal and said angle signal.

4,690,381

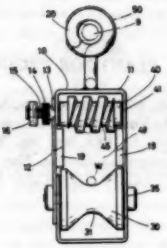
PULLEY BLOCK ASSEMBLY FOR AERIAL LINE

Masaki Asai, Nagoya, Japan, assignor to Meitoh Denki Kohji Kabushiki Kaisha, Aichi, Japan

Filed Jul. 8, 1985, Ser. No. 752,692

Int. Cl.[4] B66D *3/06*; H02G *1/02*

U.S. Cl. 254—394 **14 Claims**



1. A pulley-block unit for an aerial line comprising:

(a) a pulley frame;

(b) a pulley rotatably supported by said pulley frame; and

(c) an inverting guide roller rotatably supported by said pulley frame, opposed to and parallel to said pulley, having a helical groove on the periphery thereof; wherein said pulley frame guides an aerial line between said pulley and said inverting guide roller.

4,690,382

COVING ATTACHMENT

Edward A. Koperdak, Kalamazoo, Mich., assignor to Cope, Inc., Schoolcraft, Mich.

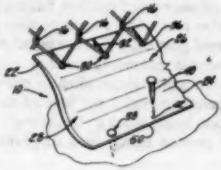
Filed Dec. 23, 1985, Ser. No. 812,503

Int. Cl.[4] E04H *17/00*

U.S. Cl. 256—1 **11 Claims**

1. A one-piece coving strip (10) of the type utilized along fences, rails, or the like, for preventing vegetation growth at the base thereof, comprising:

an upper fence-engaging portion (22) and a lower ground-engaging portion (24), joined together by curved connections (26,28) and characterized by attachment means (36) for directly attaching said upper portion by interlocking said portion with a fence (16), rail, or the like, so as to cover an area of ground between the fence and said



ground-engaging portion, preventing vegetation growth and the passage of objects thereunder.

4,690,383

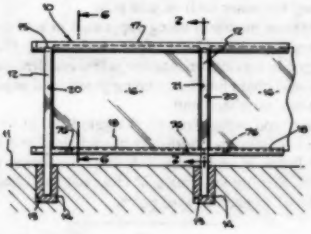
PANEL RAIL SYSTEM

Roy W. Batcheller, West Covina, Calif., assignor to Craneveyor Corp., South El Monte, Calif.

Filed Apr. 4, 1986, Ser. No. 848,244

Int. Cl.[4] E04H *17/16*

U.S. Cl. 256—24 **9 Claims**



1. A panel rail system comprising posts adapted to be set at locations in an appropriate surface structure, unitary panels having each an upper edge and a lower edge for substantially spanning the area between adjacent posts, an upper rail having a longitudinal slotted junction for reception of the upper edge of the panel, a lower rail having a longitudinal slotted junction for reception of the lower edge of the panel, said posts having an upper and lower retention means for supporting retention of the rails, the upper retention means having a rail-engaging means for reception of the upper rail, the lower retention means having a rail-engaging means for reception of the lower rail, and a connector adapted to interconnect said respective rail-engaging means and the corresponding rail, each post having a chamber throughout its length and said retention means comprising a sleeve with a sliding fit within the chamber.

4,690,384

CHAIN LINK FENCE SYSTEM

Thomas M. Palmer, Houston, Tex., assignor to Innovative Research and Development Co., Houston, Tex.

Filed Jul. 16, 1984, Ser. No. 631,062

Int. Cl.[4] B21F *27/00*

U.S. Cl. 256—47 **2 Claims**

1. A chain link fence system comprising

a pair of end, corner, or gate posts anchored vertically in the earth in laterally spaced relation,

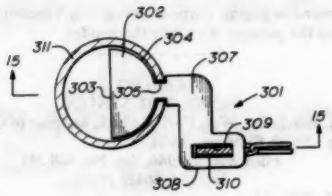
a cross bar extending between the upper ends of said posts and secured thereon, and

a chain link fence material extending between and secured at opposite ends to said posts, in which

each of said posts comprises a tubular metal post having a series of vertically aligned retaining bands spaced longitu-

dinally thereof with narrow openings extending between said bands in vertically oriented and vertically aligned linear relation,

a plurality of retainer members each comprising a flat plate having a retainer head portion having a flat edge and a semi-circular rear edge, a neck portion connected to said retainer head portion, a flat L-shaped supposting portion with a laterally extending portion extending from said neck portion and a longitudinally extending portion extending therefrom with a slot located therein, said retainer head portion being sized to fit through said post slot and said neck portion being sized to permit the same to be



turned 90° in said slot with said semi-circular rear edge fitting the inner wall of said post,

said retainer members being supported in said openings and extending outward therefrom and having their slots arranged in vertical orientation when installed on said posts,

one of said chain link fence being positioned adjacent to said retainer members, and

a retainer rod comprising an elongated rod of flat, rectangular cross section positioned in said slots and through the end loops of said chain link fence to secure the same in place, thereby securing said cross bar and chain link fence material to each of said posts.

4,690,385

METHOD FOR STORING AND MAINTAINING THE TEMPERATURE OF MOLTEN METAL

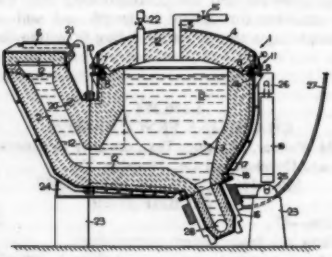
Günther Beele, Kerpen-Blatzheim, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Division of Ser. No. 836,095, Mar. 4, 1986, Pat. No. 4,638,980. This application Oct. 6, 1986, Ser. No. 915,779

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1985, 3507648

Int. Cl.[4] C21C 7/02

U.S. Cl. 266—44 **4 Claims**



1. A method of storing and maintaining the temperature of a nodular cast iron melt comprising:

providing a heatable furnace having an inner chamber adapted to receive a cast iron melt,

at least partially filling said inner chamber with a nodular castiron melt which has been treated with magnesium,

maintaining the temperature of said melt within a predetermined range of casting temperature values,

closing said furnace chamber with a sealed pressure-tight cover, and

filling the space in said inner chamber above said melt with an inert gas and pressurizing said gas to an extent sufficient to prevent disintegration of the magnesium in said melt.

4,690,386

METHOD OF IMPROVING THE SERVICE LIFE OF PERMEABLE REFRACTORY ELEMENTS IN BOTTOMS OF METALLURGICAL VESSELS

Guy Denier, Metz, France, and Romain Henrion, Luxembourg, Luxembourg, assignors to Institute de Recherches de la Siderurgie Francaise, Maizieres-Les-Metz, France

Filed Apr. 20, 1983, Ser. No. 486,844

Claims priority, application France, Apr. 22, 1982, 82 07118

Int. Cl.[4] C21C 5/44

U.S. Cl. 266—44 **6 Claims**

1. A method of improving the service life of permeable refractory elements provided in a bottom of a converter, the elements serving for controlled injection of a stirring fluid into a molten metal bath contained in the converter, the method comprising the steps of conserving in the converter a fluid slag formed during refining of a charge, after a liquid metal has been cast by tipping the converter, depositing and spreading the slag over the bottom by bringing the converter back to its upright position, wherein the slag has a sufficient fluidity to spread over the bottom, and leaving the slag to harden and set on the bottom while a sufficient pressure which insures a permanent flow of the stirring fluid approximately close to in the order of 30 m^3/h per refractory element is maintained in the permeable refractory elements.

4,690,387

METALLURGICAL PLANT FOR PRODUCING A MIXED GAS

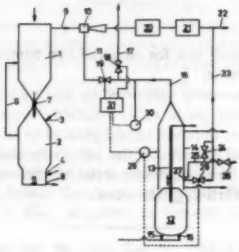
Walter Rockenschaub, and Werner Kepplinger, both of Linz, Austria, assignors to Voest-Alpine Aktiengesellschaft, Austria

Filed Nov. 5, 1985, Ser. No. 795,090

Claims priority, application Austria, Nov. 19, 1984, 3652/84

Int. Cl.[4] C21B 7/22; C21C 5/38

U.S. Cl. 266—144 **2 Claims**



1. In a plant for producing steel from iron-oxide containing starting materials and including a plant for recovering pig iron comprised of a reduction shaft furnace and a melt-down gasifier, and at least one oxygen blowing converter for converting said pig iron into steel by utilizing process gases forming, the improvement comprising:

a top gas duct system provided for said reduction shaft furnace, said top gas constituting said process gas, at least one off-gas duct connected to and provided for said oxygen blowing converter;

an ejector connecting said top gas duct system with said off-gas duct, said converter off-gas being feedable into said top gas duct via said ejector to produce a mixed gas;

common dedusting and washing means connected to said ejector and provided for the mixed gas formed by said top gas and said converter off-gas; and

safety means for preventing the entry of oxygen into said mixed gas.

4,690,388

PNEUMATIC VEHICLE SUSPENSION WITH FAILSAFE INTERNAL STOP

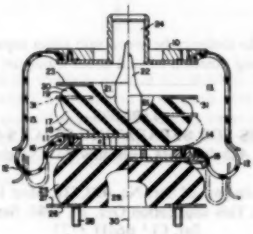
Reginald Harrison, Oadby, England, assignor to Dunlop Limited, United Kingdom

Continuation of Ser. No. 713,639, Mar. 19, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,882

Claims priority, application United Kingdom, Mar. 29, 1984, 8408167

Int. Cl.[4] B60G *11/62*; F16F *3/08*

U.S. Cl. 267—35 **15 Claims**



1. A vehicle suspension comprising a pneumatic spring having a closed body with first and second rigid members interconnected by a toroidal shape flexible member of substantially gas-impermeable material and provided within the pneumatic spring an elastomeric spring having a first end connected to said first rigid member and a second end which is spaced from said second rigid member when the closed body of the pneumatic spring is pressurized to a normal working pressure, said second end being free to move transversely relative to said first end, the elastomeric spring being positioned within the closed body of the pneumatic spring such that in normal use of the vehicle suspension applied compression loading is withstood solely by the pneumatic spring and such that the applied compression loading acts on the elastomeric spring only in the event of a pressurization failure of the pneumatic spring, said elastomeric spring being of generally circular cross-sectional shape in a plane perpendicular to the normal direction of movement of the rigid members one towards the other and of pregressively increasing external diameter over at least a part of the length thereof from one end of the elastomeric spring to the other whereby in the event of pressurization failure of the pneumatic spring the elastomeric spring allows relative movement of the first and second rigid members both in said normal direction of movement of the rigid members one towards the other and in directions perpendicular thereto and whereby both the vertical compression stiffness and horizontal shear stiffness of the elastomeric spring progressively increase when, in use, the elastomeric spring is subject to an increasing compression loading.

4,690,389

HYDRAULICALLY DAMPED MOUNTING DEVICE

John P. West, Devizes, England, assignor to Avon Industrial Polymers Limited, Wiltshire, England

Filed Aug. 6, 1985, Ser. No. 763,123

Claims priority, application United Kingdom, Aug. 7, 1984, 8420035; Jan. 25, 1985, 8501863; May 28, 1985, 8513408

Int. Cl.[4] F16M *5/00*; F16F *15/04, 7/10*; B60G *15/04*

U.S. Cl. 267—140.1 **9 Claims**

1. A hydraulically damped mounting device having first anchor and a second axial anchor, for damping vibrations in direction orthogonal to said second anchor comprising:

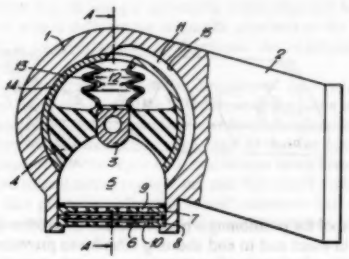
a hollow sleeve formed at said first anchor;

second anchor formed within said sleeve, said second anchor extending axially of said sleeve, said sleeve and said second anchor defining a space extending radially from said second anchor to said sleeve;

a resilient wall within said space connecting said sleeve and said second anchor and thereby subdividing said space into two pockets, said resilient wall being adapted to be compressed in a predetermined direction when a load is applied to the hydraulically damped mounting device;

a working chamber in one pocket of said space and enclosed between said sleeve and said resilient wall, said working chamber containing a liquid;

a bellows wall of corrugated material withing said space in the other of said pockets;



a compensation chamber within said space bounded, at least in part, by said bellows wall; and

an open passageway connecting said working chamber and said compensation chamber to allow fluid communication of said liquid between said working chamber and said compensation chamber;

said working chamber is physically separate from said bellows wall and having substantial different spring characteristics, thereby effectively separating the spring effect of the device from the damping effect thereof with the spring effect substantially determined by the resilient wall and the damping effect substantially determined by the flow characteristics of the passageway, and at least parts of said bellows wall remote from said second anchor point are physically separate from said resilient wall.

4,690,390

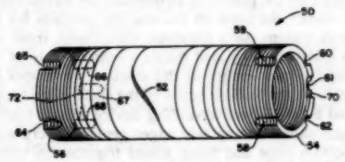
OVERRUNNING CLUTCH SPRING

Jules G. Kish, West Haven, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 660,332, Oct. 12, 1984, abandoned. This application Sep. 19, 1986, Ser. No. 910,333

Int. Cl.[4] F16F *1/06*; F16D *13/04*; B23P *13/00*

U.S. Cl. 267—155 **4 Claims**



1. A method of manufacturing an overrunning clutch spring having a center crossover point from tube stock, comprising:

rotating the tube stock;

axially feeding a cutter along the rotating tube stock at an exponential rate until a position before the center crossover point; and

continuing to axially feed the cutter along the rotating tube stock from the position before the center crossover point to the center crossover point at greater than the exponential rate.

4,690,391

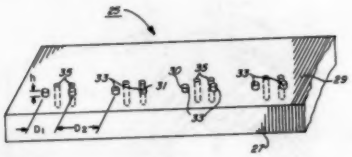
METHOD AND APPARATUS FOR FABRICATING FULL WIDTH SCANNING ARRAYS

James C. Stoffel, Rochester, and Jagdish C. Tandon, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 31, 1983, Ser. No. 462,593

Int. Cl.[4] B25B *11/00, 11/02*

U.S. Cl. 269—21 **3 Claims**



1. A tool for positioning a preset number of smaller scanning arrays in exact end to end abutting relation to provide a composite scanning array of predetermined length, comprising:

(a) a base having at least one substantially flat surface; and

(b) a plurality of discrete array aligning formations on said base flat surface arranged in a predetermined array alignment pattern, said array alignment formations being adapted for interlocking cooperation with plural array aligning formations on each of said small arrays on assembly of said preset number of said small arrays with said base whereby to accurately locate and align said small arrays in abutting lengthwise relation with one another to provide said composite scanning array of predetermined length.

4,690,392

ENVELOPE CONFIGURATION FOR USE IN A HIGH SPEED COPIER WITH ENVELOPE PRINTING CAPABILITY

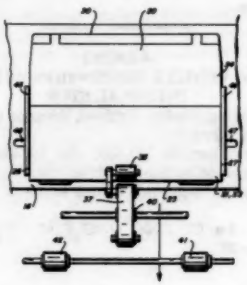
Robert A. Coons, Jr., Holcomb, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 653,408, Sep. 24, 1984, abandoned. This application Sep. 27, 1985, Ser. No. 780,866

Int. Cl.[4] B65H *5/00;* **G03B** *15/00*

U.S. Cl. 271—2 **2 Claims**

1. The combination of an envelope and a copying machine, said copying machine comprising a paper supply feeder, a stack supporting platform, a sheet transport system, a sheet separating device adapted to contact a stack of envelopes to be fed placed on the platform, to separate the envelopes seriatim, and to direct the same to the starting position for the sheet transport system, said envelope comprising front and back panels folded to form and define a bottom edge of the envelope, said bottom edges of the stack of envelopes being arranged to be the leading edges of the stack of envelopes being directed by said sheet separating device to said transport system, said panels having side edges generally perpendicular to said bottom edge and being joined together by side welding with adhesive material applied to the surfaces adjacent and inwardly, respectively, and a closure flap formed as an extension of one of the panels and being defined by side edges which extend between lines projecting from and coincident with the side edges of said one panel, respectively, and for a distance which when added to the length of said side edges of said panels when the envelope is in a flat orientation is equal to or



greater than the distance between said sheet separating device and said starting position of said sheet transport system.

4,690,393

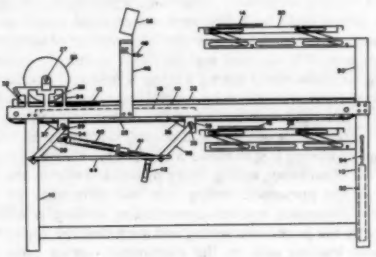
APPARATUS FOR SEPARATING STACKS OF CLOTH

Elbert Engle, Ashville, Ala., assignor to Chesebrough-Pond's, Inc., Conn.

Continuation-in-part of Ser. No. 492,721, May 11, 1983, Pat. No. 4,555,102. This application Oct. 10, 1985, Ser. No. 786,337

Int. Cl.[4] B65H *3/22*

U.S. Cl. 271—4 **10 Claims**



3. A method for detecting the presence of a fold in a ply which is being transported by passing the ply between a pair of localized magnetic field regions spaced apart essentially the full width of the ply in the absence of a fold so that opposite edges of the fold-free ply will pass through the separate field regions and detecting the magnetic field in the two regions as the ply passes.

4,690,394

STACK STOP ASSEMBLY ON A SHEET FEEDER OF A PRINTING PRESS

Bernhard Maul, Heidelberg; Günter Zobl, Leimen, and Hans-Jürgen Kusch, Neckargemünd, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,096

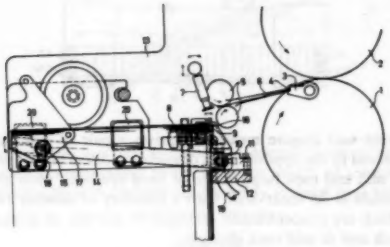
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 8406329[U]

Int. Cl.[4] B65H *5/10*

U.S. Cl. 271—11 **4 Claims**

1. Stack stop assembly on a sheet feeder of a printing press having an impression cylinder, with grippers disposed thereon formed with respective sheet stops, and having a row of suckers and a pair of conveyor rollers disposed between the sheet feeder and the impression cylinder, an uppermost sheet of a

stack of sheets being liftable at a leading edge thereof by the row of suckers over and beyond stack stops of the stack stop assembly and being feedable to the pair of conveyor rollers for advancing the uppermost sheet to the sheet stops formed on the impression-cylinder grippers, the stack stop assembly comprising swivel bearings supporting the stack stops, respec-



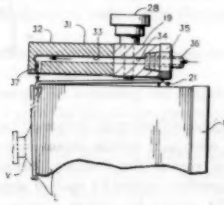
tively, at both sides thereof, each of the stack stops having a journal pin to which a pivot arm is secured, said stack stops being pivotable on said journal pins, during press operation so as to vary the direction of transport of the uppermost sheet, and being fixed against reciprocal motion with respect to the stack stop assembly.

4,690,395

LABEL MAGAZINE

Casimir W. Nowicki, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 20, 1986, Ser. No. 841,650
Int. Cl.[4] B65H *3/14*
U.S. Cl. 271—98 **6 Claims**



2. A label magazine comprising

a ring,

a tray for supporting a stack of labels, said labels have corners, said tray comprising spaced longitudinally extending L-shaped rails fixed to said ring and adapted to an edge and engaging the corners of a stack of labels and forming the sole support for the labels,

said ring having the general configuration of a label,

means at one end of said tray for yieldingly urging the labels toward the other end of the tray and,

a plurality of circumferentially spaced spring members mounted on the ring at the other end of the tray about the labels,

each member including an axially extending portion and a radially inwardly extending portion extending from one end of said axially extending portion and engaging the outermost label of the stack,

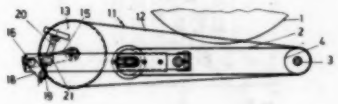
means for mounting the other end of said axially extending portion of each member.

4,690,396

DELIVERY DEVICE

Rudolf Herb, Bobenheim, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Apr. 14, 1986, Ser. No. 851,801
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515328
Int. Cl.[4] B65H *29/54*
U.S. Cl. 271—311 **15 Claims**



1. In a delivery device for sheet-like products having at least one conveyor belt defining a conveying plane disposed below a fan wheel which delivers the sheet-like products to the conveyor belt in an overlapping arrangement, the improvement comprising:

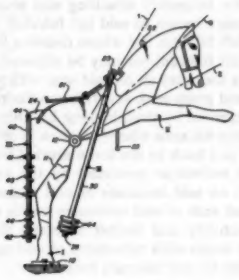
at least one bridge aligned in the direction of delivery, said bridge being raised relative to the conveying plane of the conveyor belt and sloped downwardly in the direction of delivery so that its leading edge extends into the conveying plane of the conveyor belt, said bridge being arranged relative to said conveyor belt and said fan wheel such that sheet-like products delivered to said conveyor belt from said fan wheel have a buckled like configuration while in contact with said bridge.

4,690,397

MECHANICAL HORSE FOR CHILDREN'S PLAY

Kamel Ben Y. Abed, Yarka Village 24967, Israel

Filed Dec. 24, 1985, Ser. No. 812,952
Claims priority, application Israel, Mar. 7, 1985, 74531
Int. Cl.[4] A63G *17/00*
U.S. Cl. 272—53.2 **8 Claims**



1. A children's toy in the form of a rocking horse or other animal, comprising:

a stationary part defining the hind leg or legs of said animal, positioned on the ground;

a rockable part defining the rump, the head and the forelegs of said animal, attached in its rear portion to the top portion of said stationary part by means of a pivot and adapted to swing about said pivot in a vertical plane by a predetermined angle;

a weighted pendulum attached to said rockable part by a pivot permitting its swinging motion in a plane parallel to the plane of said rockable part; and

a guide bar pivotally attached to the tail end of said rump and slidingly movable in guide means on said stationary part, said guide bar being provided with adjustable stops

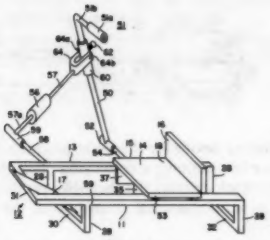
adapted to limit the rocking motion of said rockable part by a predetermined angle.

4,690,398

MULTIPURPOSE ROWING APPARATUS

Robert S. Smith, 1263 Emory St., San José , Calif. 95126

Filed Feb. 10, 1986, Ser. No. 828,317
Int. Cl.[4] A63B *69/06*
U.S. Cl. 272—72 **5 Claims**



1. An exercise machine of the rowing type having a track, a seat that rolls on the track and a footrest at the end of said track, which further comprises;

a right fulcrum bar having a first end hingeably attached to a right side of said seat and a second end;

a left fulcrum bar having a first end hingeably attached to a left side of said seat and a second end;

a right resistance means having a first end with attachment means for hingeable attachment to said track near said footrest and a second end;

a left resistance means having a first end with hingeable attachment means for attachment to said track near said footrest and a second end;

means for hingeably attaching said second end of said right resistance means to said right fulcrum bar at a location on said right fulcrum bar whose distance from said first end of said right fulcrum bar may be adjusted;

means for hingeably attaching said second end of said left resistance means to said left fulcrum bar at a location on said left fulcrum bar whose distance from said first end of said left fulcrum bar may be adjusted;

so that a user may sit on said seat with his feet on said footrest and grasp each said fulcrum bar near said second end and exercise by straightening his knees and hips and pulling with his arms whereby the ratio of force exerted by the arms and back to the force exerted by the knees to overcome resistance presented by the resistance means depends on said locations of said means for attaching said second ends of said resistance means to said fulcrum bars respectively and further whereby the resistance means force varies with movement of said seat which is coupled thereto by said fulcrum bars.

4,690,399

FLEXIBLE DUMBBELL

Sadao Hayashi, Nagoya, Japan, assignor to Asahi Gomu Kako Kabushiki Kaisha, Aichi, Japan

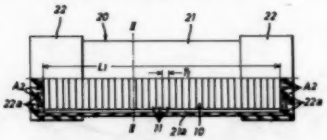
Filed Mar. 16, 1984, Ser. No. 590,305
Claims priority, application Japan, Mar. 16, 1983, 58-38220[U]; Nov. 2, 1983, 58-206636; Jan. 21, 1984, 59-9154
Int. Cl.[4] A63B *21/11*
U.S. Cl. 272—122 **5 Claims**

1. A flexible dumbbell comprising:

a cylindrical body of elastic material such as rubber formed in predetermined length and diameter suitable for use in various kinds of physical exercises;

a flexible core element of predetermined weight suitable for a user's physique contained within said cylindrical body and cooperable with said cylindrical body to provide radial resiliency of said dumbbell; and

closure means for closing the opposite ends of said cylindrical body and for retaining said core element in place by engagement therewith;



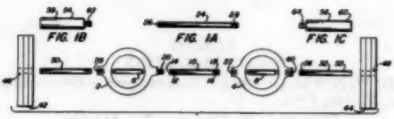
wherein said closure means comprises a pair of end caps secured to the opposite ends of said cylindrical body, each of said end caps being made of hard synthetic resin and formed at its inner wall with a plurality of annular ribs which are concentrically arranged to provide air gaps at each end of said core element.

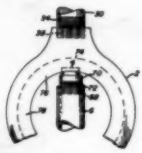
4,690,400

SUPINATING BARBELLS WITH MEANS TO SET THE FORCE FOR ROTATORY MOTION

Charles L. Metz, R.D. #9 - Box 683A, Greensburg, Pa. 15601

Filed Dec. 9, 1985, Ser. No. 806,600
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 **13 Claims**





1. Exercise means including an elongated handle means to be grasped by the user, said handle means being located within circular housing means for rotatory motion with respect thereto, a shoe member carried by each of opposite ends of said elongated handle means for rotary motion in said housing means, means operatively associated with the shoe members for varying the degree of resistance to rotatory motion of said handle means with respect to the circular housing means within which it is located and elongated bar means operatively associated with said housing means for bearing weights.

4,690,401

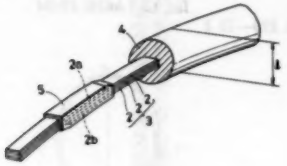
CIRCULAR SPORTING ARTICLE

Shoji Cho, Osaka, Japan, assignor to Life Environment Research Laboratories, Osaka, Japan

Filed Sep. 30, 1985, Ser. No. 781,481
Claims priority, application Japan, Sep. 29, 1984, 59-147599
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—137 **11 Claims**

1. A circular sporting article comprising (a) a core material in a ring shape made of concentric adjacent windings of a long and narrow strip of spring steel having two ends, (b) a flexible covering material to cover said circular core material, (c) at least one fitting fixing the two ends of the strip of spring steel with respect to one another, and (d) at least one fitting slidably

holding the concentric windings of the strip of spring steel to allow the windings to slide circumferentially with respect to



one another, said article having an overall diameter approximately corresponding to the shoulder length of a user and a sectional diameter which can be easily grasped by a user.

4,690,402

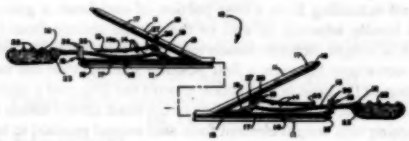
TENSILE EXERCISE DEVICE

Jack A. Basting, 1945 E. Ivy St., St. Paul, Minn. 55119

Filed Dec. 2, 1986, Ser. No. 937,197

Int. Cl.[4] A63B *21/02*

U.S. Cl. 272—137 **9 Claims**



1. A tensile exercising device for performing tension exercises, comprising:

(a) a central, longitudinal, nonelastic strap member;

(b) a pair of elastic bands, each band having an inner and outer end, and each band being connected at its inner end to opposite longitudinal ends of said elongated strap member;

(c) a pair of rubber grip members connected to said outer ends of said elastic bands; and

(d) adjusting means for adjusting the length of said elastic bands to vary with the size of the person using said device and with the exercise to be performed; and

(e) two substantially flat strips of padded sheath which encase said strap member and said adjusting means and which have ends that include means to attach each strip of said padded sheath to each other so that the ends fold back from said strap member inorder to access said adjusting means.

4,690,403

BASES FOR THE GAME OF BASEBALL

Dennis Meggs, 285 Bluevale St., Unit #4, Waterloo, Ontario N2J 4L8, Canada

Filed Dec. 26, 1985, Ser. No. 813,573

Claims priority, application United Kingdom, Dec. 31, 1984, 8432786

Int. Cl.[4] A63B *71/00*

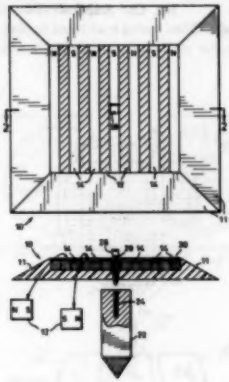
U.S. Cl. 273—25 **10 Claims**

1. A baseball base, comprising:

an anchor member having an upper portion with a top surface, and a lower portion adapted to be received in the ground to secure the anchor member in place,

the upper portion having magnetic means defining at the top surface at least four parallel, spaced, elongate bands which constitute alternating north and south magnetic poles,

and an upper member having a top portion of a size and shape corresponding to that of the usual baseball base, and a ferromagnetic plate secured to the underside of said top



portion, the plate being adapted to be retained in place on said alternating north and south magnetic poles.

4,690,404

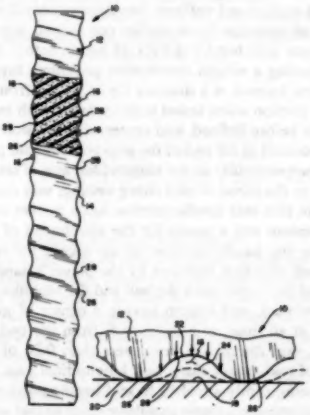
TAGGING STICK

Jerry L. Yoder, 4076 County Rd. 27, Auburn, Ind. 46706

Filed Dec. 23, 1985, Ser. No. 812,173

Int. Cl.[4] A63B *59/00*

U.S. Cl. 273—67 R **17 Claims**

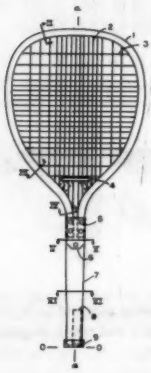


1. A tagging stick, comprising:

(a) an elongated body composed of resiliently flexible cellular foam material being stiff enough to allow grasping and swinging by a human hand;

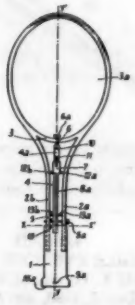
(b) a plurality of indentations formed in the exterior surface of said body to form a plurality of air pocket means for making loud sounds upon impact of said body against an object, said indentation being substantially larger than the cells of said foam material.

4,690,405
TENNIS RACKET
Jack L. Frolow, 448 Dewey St., Long Branch, N.J. 07740
Filed Oct. 19, 1983, Ser. No. 543,431
Int. Cl.[4] A63B 49/04
U.S. Cl. 273—73 C 46 Claims



1. A complete tennis racket held by the hand of a player to impact a ball comprising at least a frame including a head portion supporting a string netting in a plane and a handle portion having a grip portion suitably adapted for the hand to grip, the end of the grip portion being located at the handle portion end of the racket, said racket having a longitudinal axis running from the center of the head portion end of the racket to the center of the grip portion end of the racket; said racket having a weight and stiffness distribution providing for a frequency of vibration f_1, in cycles per second when tested in accordance with test 13 of FIG. 15 herein before defined; said racket having a weight distribution providing for a center of percussion located at a distance Cp in inches from the end of the grip portion when tested in accordance with test 4 of FIG. 15 herein before defined, said center of percussion taken about a pivot located at the end of the grip portion, said pivot having an axis perpendicular to the longitudinal axis of said frame and parallel to the plane of said string netting; said racket characterized in that said handle portion has a system comprising a weight means and a means for the attachment of said weight means to the handle portion of the racket for reducing the shock and vibration received by the player's hand during the impact of the racket with the ball and the vibration subsequent to said impact; said system having a center of gravity being located at all times at a distance F from the end of the grip portion, said distance F being less than 0.26 of the overall length of said racket along said longitudinal axis; said weight means being firmly attached to said handle portion to provide that responsive to a single impulsive force to said weight means there is no significant movement between said weight means and said handle portion; and said racket excluding said system has said distance Cp greater than 18.75 inches; and said racket excluding said system has said frequency of vibration f_1 greater than 140 cycles per second; said racket having a weight distribution providing for a moment of inertia Ia in ounce-inches squared about said longitudinal axis and the magnitude of Ia is greater than 75 ounce-inches squared, and the said magnitude of Ia being attained without a weight means being attached to the said head portion of the racket.

4,690,406
VARIABLE BALANCE RACKET
Jean Hufenus, 15A Av. Crebillon 78, 600 Maisons Laffitte, France
Filed Dec. 12, 1985, Ser. No. 808,170
Int. Cl.[4] A63B 49/04
U.S. Cl. 273—73 J 7 Claims



1. A variable balance tennis racket comprising, an annular head adapted to receive strings, an elongated handle connected to and extending from a base portion of said head, a grip on said handle adjacent an end of the handle remote from the head, a weight element, means mounting said weight element for movement between a first position spaced from the base portion of the head in a direction toward the grip, and a second position adjacent the base portion of the head, elastic means for returning said weight element from said second position to said first position, retaining means for retaining said weight element in said second position, against the return action of said elastic means, upon movement of the weight element to the second position, and means for releasing said weight element from said retaining means in response to centrifugal force of a swing of the racket so that the weight element is returned to said first position by said elastic means after a forceful swing of the racket.

4,690,407
WEIGHTED GOLF GRIP
Robert J. Reisner, Chicago, Ill., assignor to Para-Tech Industries, Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 774,566, Sep. 10, 1985, abandoned. This application Dec. 16, 1985, Ser. No. 809,039
Int. Cl.[4] A63B 53/14
U.S. Cl. 273—81 A 6 Claims

1. A golf club comprising: a shaft, a club head on one side of said shaft and a grip portion on the distal end of said club opposite said club head;

said shaft having a certain distribution of weight;

said grip portion including a weight assembly on said distal end of said shaft;

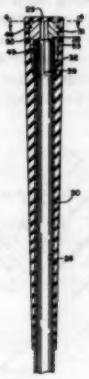
said weight assembly comprising at least two longitudinal portions located about said distal golf shaft end in spaced relationship, each longitudinal upper portion having a portion positioned entirely behind said shaft, the combined mass of said longitudinal portions being disposed equally about said shaft end,

said longitudinal portions being spaced from one another, thereby creating a gap, said gap being filled with resilient material to permit limited expansion during assembly;

said upper portions each having a flange depending therefrom, said flanges surrounding said shaft at said distal end;

said weight assembly being encompassed by a resilient grip material, and adhesively secured to said shaft, thereby maintaining the relative immobility of said weight assem-

bly and preventing movement of said weight relative to said shaft;



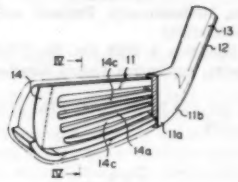
whereby said weight displaces the weight distribution on said shaft to a point closer said distal end.

4,690,408

CLUB-HEAD

Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1986, Ser. No. 837,981
Claims priority, application Japan, Mar. 14, 1985, 60-49378
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—169 **5 Claims**



1. A club-head for a golf club made of metal comprising an outer shell made of a first metal and a core body embedded in said outer shell made of a second metal, said first metal having a different specific weight from said second metal, and the weight of said core body being concentrated in an area defining the periphery of the hitting portion of the club-head.

4,690,409

METHOD OF PLAYING A LETTER SELECTING AND ARRANGING GAME

Antonino Scalia, 5639 Raven Ct., Birmingham, Mich. 48010

Continuation of Ser. No. 632,534, Jul. 29, 1984, abandoned. This application Apr. 29, 1986, Ser. No. 858,821
Int. Cl.[4] A63F *1/00*
U.S. Cl. 273—299 **1 Claim**

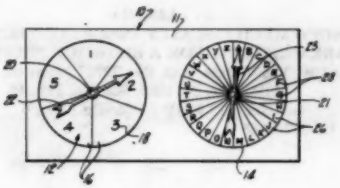
1. A method for playing a game comprising:

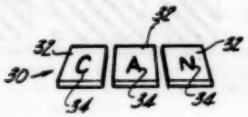
(a) spinning a first pointer pivotally secured to a first dial having a sectored face with an integer in each sector to randomly select one integer from a set of a plurality of integers;

(b) spinning a second pointer pivotally secured to a second dial having a sectored face with an alphabetic letter indicia in each sector to randomly individually select a plurality of letters of the alphabet when said integer is greater than 1, wherein the number of said plurality of individual letters corresponds to the value of said integer and wherein the probability of selecting any letter remains constant throughout the play of the game;

(c) selecting letter indicia members, each member selected having indicia designating a letter corresponding to the letters selected in step (b); and

(d) arranging said at least two letter indicia members to form an identifiable abbreviation, initial or acronym;





(e) recording a predetermined positive score value for each indicia member used in the abbreviation, initial or acronym;

(f) recording a negative score value whenever the selected integer from said first step equals a predetermined value;

(g) maintaining a recorded total score for each player until the total score for any player exceeds a predetermined amount.

4,690,410

WORD FORMING TILE GAME

Andrew S. Berton, Potts Point, Australia, assignor to Incomm Direct Pty. Ltd., State of Victoria, Australia

Division of Ser. No. 706,628, Feb. 28, 1985, abandoned. This application Jul. 29, 1986, Ser. No. 890,288
Int. Cl.[4] A63F *1/00*
U.S. Cl. 273—299 **3 Claims**

1. A word game comprising the steps of:

providing a plurality of tiles to a group of players, each said tile having a letter formed on one face thereof;

dividing said plurality of tiles between said players so that each player has a predetermined number of tiles, not to exceed an equal distribution of the tiles among the players, said tiles being so provided in a face down mode whereby a player does not know the letter of any tile until such tile is exposed during play;

sequentially exposing one tile in the possession of each of the players;

arranging a word having at least three letters from the group of letters sequentially exposed by the players;

continuing the sequentially exposing and arranging of words from the group of letters sequentially exposed by the players and by cannibalizing letters from words previously arranged by any player for forming new words;

continuing the sequential exposing, arranging of words and cannibalizing of letters from words previously arranged by any player for forming new words until the supply of

tiles is exhausted and arranged to form words, or no further words are capable of being formed;

adding up a score for each player, determined from the tiles utilized in the arranging of particular words formed by each player; and

comparing the scores of each player to determine the highest score.

4,690,411

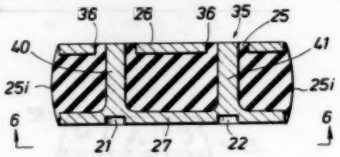
BONDED MECHANICALLY INNER CONNECTED SEAL ARRANGEMENT FOR A BLOWOUT PREVENTER

Denzal W. Van Winkle, P.O. Box 79727, Houston, Tex. 77279

Filed Dec. 23, 1985, Ser. No. 810,310

Int. Cl.[4] E21B *33/06;* **F16J** *15/16*

U.S. Cl. 277—166 **6 Claims**



1. A replaceable seal arrangement for a groove extending diametrically across the front of a blowout preventer ram body comprising:

an elastomer body having upper and lower surfaces for fitting in the groove;

plate members embedded in the upper and lower surfaces of said elastomer body;

receptacle means in one of said plate members which includes said elastomer body therein;

projection means forming part of and extending from said other plate member, through said elastomer body and into the elastomer in said receptacle means for interlocking said plate members together without securing said projection means to said one plate member to accommodate relative movement of said interlocked plate members upon expansion and contraction of said seal means, said receptacle means and elastomer body therein being significantly larger than the portion of the projection means received therein about the entire periphery of said portion to accommodate said relative movement; and

releasable means for releasably securing said seal arrangement in the groove of the ram body.

4,690,412

STRIP STRUCTURE INTENDED FOR CLAMPING ON A FLANGE

Trevor R. Tuckley, 7 The Furrows, St. Ives, Cambridgeshire, and Harold W. E. Pike, "Elm Lee", School Lane, Conington, Nr. Elsworth, Cambridgeshire, both of United Kingdom

Filed Mar. 8, 1985, Ser. No. 709,569

Int. Cl.[4] F16J *15/12;* **E06B** *7/23*

U.S. Cl. 277—184 **11 Claims**

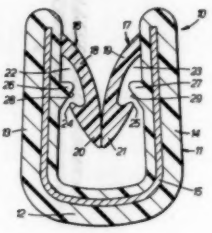
1. A strip structure intended for clamping engagement on a flange or like member, the strip structure having a channel defined by a base and two opposed side walls, each side wall being provided with an elongate limb having a free end region directed inwardly and towards the base such that the limbs abut at their free end regions;

wherein each limb has a pair of substantially straight faces in the region of the free end, one of said faces the corresponding face of the other said limb and the other of said faces generally facing the associated side wall;

wherein each side wall also is provided with an inward projection nearer the base of the channel than the root of the associated limb; and

wherein each limb is provided on that face which generally faces the associated side wall with a recess in which the projection may be accommodated;

the arrangement being such that, in use, when the strip structure is being clamped on a flange or like member, the flange causes the limbs to be moved apart, with the projections being accommodated in the corresponding recess, whereby the clamping may be effected without undue force, but, when an attempt is made to remove the strip



structure from the flange, the free end regions of the limbs grip the flange and the limbs are restrained from undue movement towards the open end of the channel by the interaction of the projections and the limbs in the region of the recesses of the latter, the configuration of the limbs and the effect of said interaction being such that considerably more force is required to remove the strip structure from the flange than is required to clamp the strip structure on the flange.

4,690,413

GASKETS

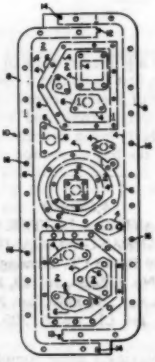
Ernest Adkins, Hildenborough, England, assignor to Klinger AG, Zug, Switzerland

Filed Sep. 3, 1985, Ser. No. 772,153

Claims priority, application United Kingdom, Sep. 3, 1984, 8422193

Int. Cl.[4] B65D *73/00;* **F16J** *15/00*

U.S. Cl. 277—199 **6 Claims**



1. A kit of gaskets comprising at least one web of dry joint grade gasket material, which web comprises (1) a plurality of gasket parts and (2) a plurality of parts serving as packaging material, the respective parts (1) and (2) being defined by cuts which extend completely through the web and along respective peripheries of the gasket parts but which cuts terminate so as to retain interconnecting regions securing the gasket parts in position in the web, whereby the gasket parts are capable of

being pushed out of the web and thereby separated therefrom, at least two of the gasket parts defining respective gasket segments, each segment being profiled at each end thereof to provide interengaging members for enabling assembly of the gasket segments, after being pushed out from the web into a gasket, and each segment, when retained in the web, being disposed so that respective end portions of respective gasket segments are in generally overlapping relationship so as to define a region of the web generally surrounded by the gasket segments, the remaining gasket parts being present within the said region of the web and at least some of the remaining gasket parts nesting essentially within one another.

4,690,414

MEANS FOR SEALING THE GAP BETWEEN TWO AXIALLY DISPLACEABLE SEALING SURFACES

Per Haaland, Oslo, Norway, assignor to Mehren Rubber A/S, Kolbotn, Norway

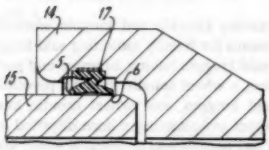
PCT No. PCT/NO84/00025, § 371 Date Feb. 8, 1985, § 102(e) Date Feb. 8, 1985, PCT Pub. No. WO85/00210, PCT Pub. Date Jan. 17, 1985

Continuation of Ser. No. 711,565, Feb. 8, 1985, abandoned. This PCT application Jun. 19, 1984, Ser. No. 838,884

Claims priority, application Norway, Jun. 20, 1983, 832235

Int. Cl.[4] F16J *15/32*

U.S. Cl. 277—207 A **4 Claims**



1. Gasket for sealing the gap between two approximately parallel first and second sealing surfaces which during assembly are displaced axially relative to each other, such that the gasket follows the first sealing surface and is compressed between said first sealing surface and the second sealing surface, said gasket being of the type in which the gasket body is made of a soft elastic material, the gasket body comprising an annular sliding part and an annular attachment part, one part being within the other part, the attachment part and the sliding part being connected through a connection part having a thickness less than the attachment part and the sliding part such that the sliding part can pivot relative to the attachment part, the axis of the connection part extending diagonally from a point of attack on one edge of the sliding part to a supporting surface on an opposite edge of the attachment part such that, in cross-section, the gasket body has a Z-type general configuration, the sliding part being inclined relative to attachment part such that the edge of the sliding part with the point of attack is nearer the attachment part than the remainder of the sliding part, the gasket being oriented relative to the sealing surfaces such that the point of attack of the sliding part is nearer to the second sealing surface prior to assembly than is the opposite edge of the attachment part.

4,690,415

HYDRAULIC NOSEPIECE ASSEMBLY FOR A COLLET CLOSER, AND METHOD

Warren B. Holdridge, 15224 S. Figueroa, Gardena, Calif. 90248

Filed Aug. 15, 1986, Ser. No. 896,968

Int. Cl.[4] B23B *31/20*

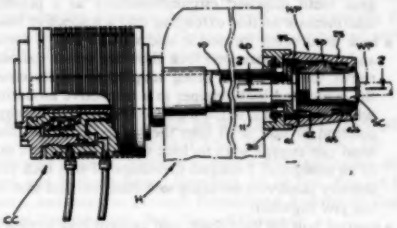
U.S. Cl. 279—4 **2 Claims**

1. In a machine tool having a rotating hollow spindle and a drawbar disposed within the spindle and rotatable therewith, and a spring collet supported from the spindle and which has a conical nose part for selectively capturing and holding a work piece, the method of closing the collet comprising the steps of:

selecting a sleeve having in its forward end a flared opening which is adapted to selectively engage the conical nose part of the collet;

placing the sleeve about the collet;

supporting the sleeve from the spindle for axially slidable movement relative thereto;



axially reciprocably moving the draw bar; and

in response to each axial movement of the draw bar, axially moving the sleeve in the opposite direction so as to either open or close the collet;

whereby the work piece is maintained in a fixed axial position relative to the spindle.

4,690,416

POWER CHUCK

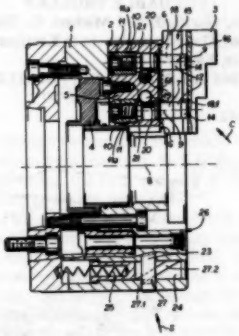
Günter H. Röhm, Heinrich-Röhm-Strasse 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Mar. 20, 1986, Ser. No. 841,558

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510457

Int. Cl.[4] B23B *31/02*

U.S. Cl. 279—110 **11 Claims**



1. A power chuck comprising:

a chuck base provided with a chuck drive;

a plurality of clamping jaws, each clamping jaw including

a base jaw guided in said chuck base, and formed with at leats one connecting opening with internal screw threads,

a respective mounting jaw releasably secured in interfacing relationship at a respective end face of a repsective one of said base jaws and formed with at least one lock retainer, and

at least one shaft disposed in said opening for respectively connecting each base jaw with its mounting jaw;

said shaft extending substantially parallel to a central longitudinal axis of the power chuck;

said shaft being rotatable between a lock position in which a

respective mounting jaw is positively secured to its base jaw, and into an unlocked position in which the respective mounting jaw can be released from its base jaw for displacement in an adjustment direction;

said shaft having a first end, an intermediate section, and a second end, said first end being formed with external screw threads engageable with the internal screw threads of said connecting opening in a respective base jaw;

said intermediate section being formed with a plurality of gear teeth disposed circumferentially as a pinion, said intermediate section extending into a respective base jaw;

a lock head being formed at said second end of each shaft and having at least one lock shoulder which extends therefrm, said lock head being adapted to axially enter into the associated lock retainer in a respective mounting jaw when said shaft is in the unlocked position, whereby upon rotation of said shaft into the locked position said lock head can engage with its lock shoulder against a dovetail of an elongated T-shaped formation of said lock retainer, thereby positively securing said base jaw and said mounting jaw together;

a control bolt for said shaft, said control bolt having a central longitudinal axis extending transversely with respect to the central longitudinal axis of said shaft and being shiftable transversely thereto, said control bolt having a plurality of rack-forming teeth meshing with said pinion;

guided control pieces for shifting a respective control bolt in the chuck base, with at least one control piece being provided on either side of the respective base jaw, said control pieces being axially algined with respect to the control bolt and being adapted for the longitudinal displacement thereof;

push rods disposed in said chuck and adapted to be actuated from the exterior thereof against the force of respective reset springs for the control pieces, said push rods being axially guided in said chuck; and

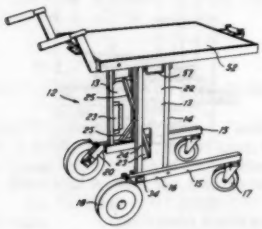
a wedge-type transmissions for operatively connecting a respective push rod and control piece.

4,690,417

FOLDABLE TROLLEY

David R. Betts, Dartford, and Michael G. Edmonds, Bexley, both of United Kingdom, assignors to Kentinental Engineering Limited, Kent, England

Filed Jan. 28, 1986, Ser. No. 823,223
Int. Cl.[4] B62B *3/00*
U.S. Cl. 280—42 **10 Claims**



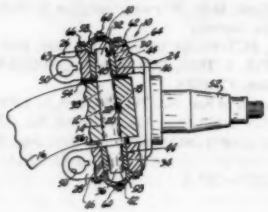
1. A trolley comprising a trolley base and a trolley top arranged to be releasably supported on the trolley base, the trolley base having two sides each of which has an upright portion and a support portion and wheel means on which the trolley base can be pushed over the ground in an erected working condition in which the upright and support portions are at an angle to one another and the sides are spaced apart and which trolley base is movable by a double folding action between the erected condition and a folded condition in which the sides are juxtaposed and the angle between the upright and support portions is reduced so that they lie substantially adjacent one another, and including locking means arranged to lock the upright and support portions in their relative erected condition and release means coupled to the locking means and arranged to release the locking means on movement of the sides to the juxtaposed condition and means arranged to cause the locking means to automatically re-engage when the upright and support portions are moved to their relative erected condition with the sides spaced from one another.

4,690,418

STEERING KNUCKLE AND KINGPIN ASSEMBLY

Joseph E. Smith, Birmingham, Mich., assignor to V. W. Kaiser Engineering, Inc., Millington, Mich.

Filed May 7, 1985, Ser. No. 731,556
Int. Cl.[4] B60G *3/02*
U.S. Cl. 280—96.1 **21 Claims**



1. A steering knuckle and kingpin assembly comprising a kingpin, means for fixedly mounting said kingpin on a support member, said kingpin having an upper end portion and a lower end portion, a wheel spindle knuckle pivotally mounted relative to said kingpin, said wheel spindle knuckle having an integral upper yoke having a bore disposed around said kingpin upper end portion and an integral lower yoke having a bore disposed around said kingpin lower end portion, a pair of bushings disposed in each of said bores in said yokes, at least one of said bushings having a peripheral surface fitted in said bore and an internal surface forming a bearing surface in engagement with one of said kingpin end portions, and means for compensating for an increase in clearance between said bearing surfaces due to wear by displacing said bushing longitudinally in a direction that causes said bushing internal surface to be urged toward engagement with said kingpin end portion,

wherein at least one of said kingpin end portions has a frusto-conical peripheral surface and corresponding bushing has a cylindrical peripheral surface fitted in a cylindrical bore in a yoke and a frusto-conical internal surface forming said bearing surface with said kingpin end portion.

4,690,419

REFLECTORIZED SPLASH GUARD

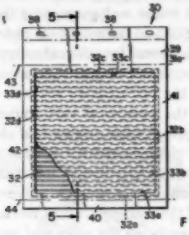
Dale E. Hoshal, Minneapolis, Minn., assignor to Luma Guard, Inc., West Minneapolis, Minn.

Continuation-in-part of Ser. No. 485,662, Apr. 18, 1983, abandoned. This application Aug. 16, 1985, Ser. No. 766,824
Int. Cl.[4] B62D *25/16*
U.S. Cl. 280—154.5 R **2 Claims**

1. A splash guard for an over the road vehicle, said splash guard of the type adapted to receive a reflectorized insert, said splash guard comprising:

(a) a base member having a top end and a bottom end and having an inner cavity, said inner cavity having an opening sized smaller than said inner cavity and larger than the insert, the inner cavity being aligned with a series of parallel ribs, each rib having a concave tip, the insert being insertable in the said inner cavity and retained in said inner cavity by means of a suction effect, the insert being retained within the inner cavity by means of the concave tip

of each rib serving as a suction cup which grips the insert; and



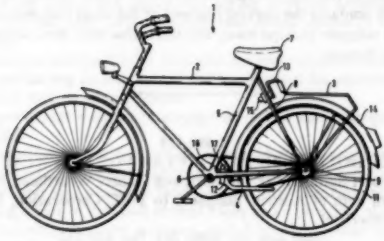
(b) means for operatively connecting said base member to the vehicle.

4,690,420

VIBRATION-RESISTANT, SELF-CENTERING ACCESSORY ATTACHMENT FOR A CYCLE

Heinrich Belka, Bielefeld, Fed. Rep. of Germany, assignor to ESGE-Marby GmbH & Co. KG, Bielefeld, Fed. Rep. of Germany

Filed May 1, 1986, Ser. No. 858,196
Int. Cl.[4] B62H *1/02*; B62J *7/04*
U.S. Cl. 280—289 A **17 Claims**



1. In combination with a cycle (1) having spaced, essentially parallel or slightly diverging support struts (8, 12; 12*a*, 12*b*),

a vibration-resistant, self-centering attachment element (13, 16) for attachment of an accessory, particularly of a luggage carrier (3) or a kickstand (4) to the cycle,

wherein the accessory (3, 4) includes counter holding means forming a bearing surface (3*a*, 4*a*; 46) for engagement with the support struts,

said attachment element (13, 16) having a cross piece formed with a central portion (18) and two lateral flange portions (19, 21) spanning the space between the spaced support struts, an aperture (24) formed in the central portion of the cross piece having an aperture axis extending perpendicularly to a theoretical plane connecting said flange portions and a clamping screw (17) passing through the aperture and into the counter holding means,

and wherein, in accordance with the invention,

the element is formed with facing end surfaces (26, 27) located in essentially parallel planes, which essentially parallel planes are parallel with respect to the axis of the aperture (24),

the flange portions (15, 21) form similar wedge elements with upper and lower surfaces diverging from outer end portions (33, 34) of the wedge elements towards the central portion (18), which define, in cross section in a plane parallel to the axis of the aperture and transverse to the struts, triangles which have bases (22, 23) adjacent the central portion (18);

the flange portions (19, 21) are elastically deformable in a direction parallel to the axis of the aperture (24);

the similar wedge elements of the flange portions are formed with hollow spaces (35, 36) which, in cross section, correspond essentially to the cross section of the respective flange portion, and extend from one facing end surface (26) of the respective flange portion to the other facing end surface (27) thereof; and

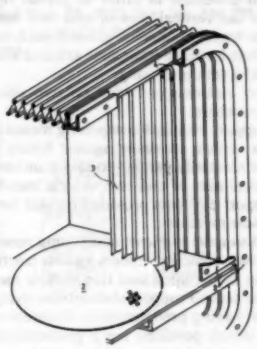
wherein the central portion (18) is formed with an essentially rectangular prismatic hollow space (25) extending from one facing end surface (26) to another facing end surface (27) of the attachment element.

4,690,421

CROSSOVER SHELTER BETWEEN SECTIONS OF ARTICULATED ROAD AND RAIL VEHICLES

Helmbrecht Schmidt, Vellmar; Robert Koch, Bad Sooden-Allendorf, and Richard Seyer, Baunatal, all of Fed. Rep. of Germany, assignors to Hubner Gummi-und Kunststoff GmbH, Kassel-Bettenhausen, Fed. Rep. of Germany

Filed Oct. 17, 1985, Ser. No. 788,489
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1984, 3439807
Int. Cl.[4] B60D *5/00*; B61D *17/22*
U.S. Cl. 280—403 **2 Claims**



1. For use between two articulated vehicle sections having a crossover platform between them, each of the vehicle sections having an end facing the opposite end of the other vehicle section, a crossover shelter comprising:

a bellows in the form of a tube completely surrounding the crossover platform and a passageway region between the opposed ends of the vehicle sections, the bellows unit being accordion-folded and defining a roof portion and two opposite side walls of the passageway region, the side walls being spaced outwardly from the sides of the crossover platform so that a gap is present between each side wall and the crossover platform,

a curtain spaced inwardly from each bellows side wall and spaced inwardly from the gap between its respective side wall and the crossover platform, each curtain being accordion-folded in a manner corresponding to the accordion folds of the bellows, and each curtain extending from the roof portion of the bellows to about the level of the upper surface of the crossover platform,

a plurality of angle brackets for suspending each curtain from the roof portion of the bellows, one leg of each angle bracket being fixed to the roof portion of the bellows and the other leg of each angle bracket being fixed to the curtain, and

a frame secured to each of the opposed ends of the two vehicle sections, one end of the bellows and the corresponding ends of the two curtains being fastened to each

of the frames, whereby the crossover shelter is secured between the opposed vehicle ends.

4,690,422

JOINT FOR A TRANSVERSELY SEPARATED VEHICLE

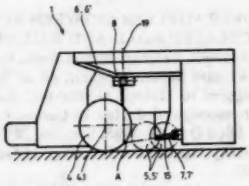
Max Brändli, and Hansueli Feldmann, both of Safnern, Switzerland, assignors to JD-Technologie AG, Zug, Switzerland

Filed Oct. 21, 1985, Ser. No. 789,627

Claims priority, application Switzerland, Oct. 26, 1984, 05134/84

Int. Cl.[4] B60D *1/00*

U.S. Cl. 280—460 R **17 Claims**



11. A joint pivotably interconnecting two vehicle members each having a vertical axis across a transverse line dividing the wheel base of a vehicle in order to permit relative angular deflections of the vertical axes of said two vehicle members due to vehicle travel on uneven ground, each one of said two vehicle members having a transverse axis and a central longitudinal axis, said joint comprising:

first support elements provided on two sides of said two vehicle members;

said first support elements comprising means for supporting said two vehicle members against forces which are directed substantially parallel to said transverse axes and to said vertical axes of said two vehicle members;

second support elements provided on said two sides of said two vehicle members;

said second support elements comprising means for supporting said two vehicle members against traction and bracking forces acting upon said two vehicle members;

said first and second support elements cooperating with each other and having predetermined interdependent positions each of which positions has a predetermined deflection angle between said two vehicle members and a predetermined transverse virtual pivot axis; and

said first and second support elements including means for permitting relative angular deflections of the vertical axes of said two vehicle members and corresponding parallel displacements of said predetermined transverse virtual pivot axis.

4,690,423

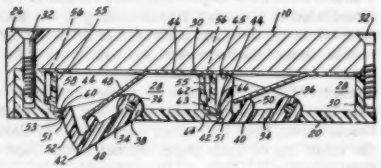
SKI BRAKING DEVICE

Walter J. DeVigili, 4215 Brown Rd., Emmett, Mich. 48022

Filed Mar. 31, 1986, Ser. No. 846,611

Int. Cl.[4] A63C *7/10*

U.S. Cl. 280—605 **3 Claims**



1. A braking device for reducing or retarding rearward movement of a ski, such as when climbing a hill, comprising an elongated frame adapted to be mounted lengthwise in a recess in the bottom of a ski with its bottom surface flush with the bottom surface of the ski, a plurality of cleats spaced apart lengthwise of said frame and projecting through openings in the bottom surface of said frame, means pivoting the front ends of said cleats to said frame for vertical movement of said cleats about horizontal axes extending at right angles to the longitudinal center line of the ski between a lower operative position projecting below the bottom of said frame and an upper retracted position, spring means urging said cleats to their operative positions, said cleats having teeth on the rear ends adapted to dig into snow when climbing a hill and said cleats are in their operative positions, means for preventing movement of said cleats beyond their operative and retracted positions, said openings closely receiving the sides and ends of said cleats to restrict the entrance of snow into said frame through said openings, the rear ends of said cleats being curved on a radius centered on their axes of vertical movement so as to remain in close contact with the rear walls of said openings throughout their vertical movement, the rear wall of each opening having a ledge providing a snow stripper which is in continuous contact with the curved rear end of the associated cleat through the full range of its movement to wipe away snow and keep it from packing into and clogging the cleat chamber, the rear wall of each opening having a pocket beneath the snow stripper in which snow is allowed to collect when the cleat is pivoted to its retracted position without being forced past said snow stripper, and a cleat wiper for each cleat, said cleat wiper being located in a cleat chamber at the rear of the cleat and pivoted at the top, the foot of said cleat wiper having an edge which contacts the curved rear end of the cleat just above said snow stripper to wipe away any snow that may have accumulated thereon.

4,690,424

HEEL HOLDER, IN PARTICULAR FOR A RENTAL SKI

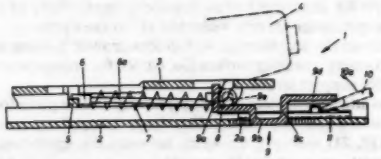
Englebert Spitaler, Wr. Neudorf, and Hubert Wuerthner, Hainburn both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Jan. 29, 1986, Ser. No. 823,552

Claims priority, application Austria, Feb. 1, 1985, 279/85

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—633 **8 Claims**



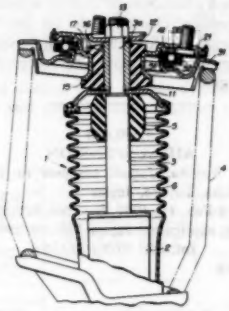
1. In a heel holder, in particular for a rental ski, which with its underside is guided on a guide rail adapted to be fastened to a ski, said guide rail having at least one toothed segment, said heel holder including a locking member which has at least one toothed segment which can be locked with respect to said guide rail and is biassed by at least one spring, said locking member being pivotal about a transverse axis on said heel holder and projects toward a tail end of said ski beyond said heel holder, the improvement comprising wherein directly below a tail end of said locking member there is arranged a guard plate for covering primarily the section of said toothed segment that lies opposite said tail end area of said locking member so that a tool inserted between said tail end of locking member and said guard plate will be unable to contact said toothed segment on said guide rail and effect damage thereto.

4,690,425

SHOCK ABSORBER MOUNT ASSEMBLY FOR MOTOR VEHICLE SUSPENSION

Kanji Kubo, Kanagawa, Japan, assignor to Honda giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 872,122
Claims priority, application Japan, Jun. 11, 1985, 60-87724[U]
Int. Cl.[4] B60F *11/16*
U.S. Cl. 280—668 8 Claims



1. A mount assembly for mounting a shock absorber/coil assembly in a motor vehicle suspension, the shock absorber/-coil assembly including a fluid cylinder, a piston rod movable into and out of the cylinder, a vibration isolator mounted on an end of the piston rod, and a coil spring disposed around the fluid cylinder and the piston rod, said mount assembly comprising:

a retainer adapted to be mounted on said vibration isolator and having an attachment portion adapted for attachment to a motor vehicle frame;

a spring seat adapted to engage an end of said coil spring; and

a thrust bearing interposed between said attachment portion of said retainer and said spring seat and adapted to extend around said vibration isolator, said thrust bearing including a pair of first and second races and a plurality of balls rotatably disposed between said first and second races, said first race engaging said retainer and said second race engaging said spring seat.

4,690,426

TRAILING ARM JOINT STRUCTURE

Kanji Kubo, Tokyo; Nobuyoshi Asanuma, Saitama; Kazuo Saito, Tokyo, and Yasuhiko Yamamoto, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1985, Ser. No. 773,438
Claims priority, application Japan, Sep. 6, 1984, 59-135519[U]; Sep. 6, 1984, 59-135520[U]
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—690 5 Claims

1. A trailing arm joint structure comprising:

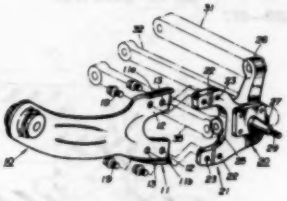
a knuckle for supporting a wheel;

a substantially plate-like trailing arm lying in a vertical plane and having a front end adapted to be pivotally coupled to a vehicle frame and a rear end rigidly coupled to said knuckle;

said knuckle having a front bifurcated portion composed of first upper and lower joint fingers extending forwardly and spaced vertically from each other, said knuckle having a link joint positioned between said first upper and lower joint fingers;

said rear end of the trailing arm having a rear bifurcated portion composed of second upper and lower joint fingers extending rearwardly and spaced vertically from each other, said front and rear bifurcated portions being held against each other with said first and second upper and lower joint fingers being fastened together; and

said trailing arm includes more-rigid portions which are



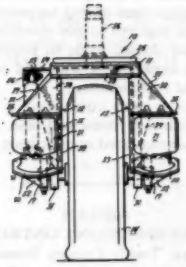
longitudinally and horizontally separated by a less-rigid portion so that said trailing arm has an increased buckling strength at said more rigid portions, but is transversely flexible at said less rigid portion.

4,690,427

FORK MOUNT MONO-WHEEL SUSPENSION

John E. Raidel, Sr., Rte. 1, Box 400-N, Springfield, Mo. 65804

Filed Nov. 23, 1983, Ser. No. 554,579
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—694 6 Claims



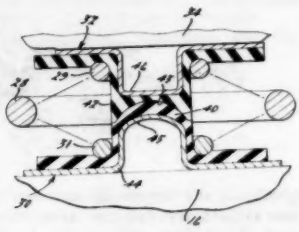
1. In a wheel mount particularly adapted to a single wheel mounted on an axle; the combination of a fork mount having a transverse block at its upper end, means on the top of the block to mount the wheel mount for turning movement on an axis, and two depending side members secured to the block, one for the left side and one for the right side of the wheel; each side member comprising a plate forming a pedestal extending fore and aft with respect to the wheel with its forward edge being rearward of the front part of the wheel, left and right rocker beams extending fore and aft with respect to and on opposite sides of the wheel; connecting means including left and right pivot shafts for rockably connecting the left and right rocker beams, respectively, to the lower parts of the left and right pedestal plates, the forward edges of the pedestal plates being substantially coterminous with the forward ends of the rocker beams and having reinforcing flanges thereon; each rocker beam having means to the rear of the pivot shaft to connect the same to the wheel axle and also having a rear end extending rearward of the wheel axle; each pedestal plate having a spring attachment means spaced above said rear end of the rocker beam to form an upward and backward space, and a spring means mounted between the rear ends of each left and right rocker beam and the respective spring attachment means on each left and right pedestal plates.

4,690,428

DOUBLE ISOLATED JOUNCE BUMPER SYSTEM

Jerry H. Fluegge, Manitou Beach, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 15, 1984, Ser. No. 671,645
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—697 **5 Claims**



1. A motor vehicle suspension comprising a chassis, a wheel carrier, a roadwheel and tire assembly and one or more control arms pivotally attaching said wheel carrier to said chassis, characterized in that the suspension includes a jounce bumper system comprising:

(A) a first member comprising:

(i) a base attached to said chassis; and

(ii) a shaped projection depending from said base;

(B) a second member engageable with said first member during full suspension jounce, comprising:

(i) a base attached to a suspension component subject to vertical displacement during suspension jounce; and

(ii) a projection attached to and extending upwardly from said base and shaped so as to permit complementary interlocking engagement with said projection depending from said first member;

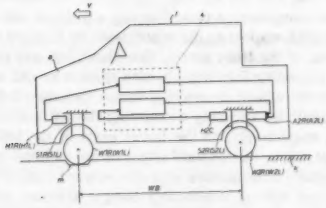
(C) said projections each comprising a rigid armature, a portion of which also forms said base, and a covering of elastomeric material fitted over at least part of said armature.

4,690,429

REAR SUSPENSION CONTROLLER

Ken Asami, Nagoya; Toshio Onuma, Susono; Kaoru Ohashi, Okazaki, and Shuuichi Buma, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 13, 1986, Ser. No. 818,140
Claims priority, application Japan, Jan. 16, 1985, 60-7248
Int. Cl.[4] B60G *17/00*
U.S. Cl. 280—707 **8 Claims**



1. A rear suspension controller for a vehicle having a suspension between a vehicle body and a rear wheel comprising:

a front vehicle height detecting means for measuring a distance between the vehicle body and a front wheel and for generating a front data signal;

a first judgment means for comparing the front data signal with a first preset range and for generating a first judgment signal if the first data signal is out of the first preset range;

a rear vehicle height detecting means for measuring distance between the vehicle body and a rear wheel and for generating a rear data signal;

a second judgment means for comparing the rear data signal with a second preset range and for generating a second judgement signal if the rear data signal is out of the second preset range; and

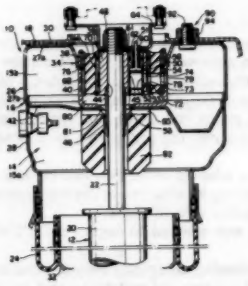
a rear suspension characteristic alteration means for altering a rear suspension characteristic on receiving the first judgment signal and for returning the suspension characteristic to an unaltered state after receiving the second judgment signal.

4,690,430

AIR SUSPENSION

Shuuichi Buma, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 14, 1986, Ser. No. 829,313
Claims priority, application Japan, Feb. 14, 1985, 60-18333[U]
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—708 **5 Claims**



1. An air suspension assembly provided with an air chamber for an air spring positioned below a car body surrounding a shock absorber, comprising:

a piston rod;

a housing for forming said air chamber having a support including a connecting member connected with said piston rod and a resilient bushing disposed outside the connecting member;

a spacer disposed radially outwardly of said support between said housing and the car body; and

means for securing said housing to the car body and for transmitting a majority of a force from the air spring directly to the car body.

4,690,431

SYSTEM FOR CONTROLLING CORNERING CHARACTERISTICS OF WHEELED VEHICLE

Ken Ito, and Naohiko Inoue, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 9, 1985, Ser. No. 773,621
Claims priority, application Japan, Sep. 10, 1984, 59-188154
Int. Cl.[4] B62D *6/02*
U.S. Cl. 280—771 **18 Claims**

1. A steering control system for a controlled vehicle having a pair of first wheels and a pair of second wheels, comprising:

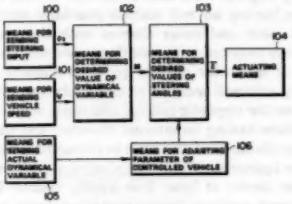
steering input sensing means for sensing a steering input quantity representing a driver's steering command of said controlled vehicle and determining a sensed value of said steering input quantity,

vehicle speed sensing means for sensing a vehicle speed of

said controlled vehicle and determining a sensed value of said vehicle speed,

target behavior determining means connected with said steering input and vehicle speed sensing means for determining a desired value of at least one dynamic variable corresponding to said sensed values of said steering input quantity and said vehicle speed by solving for said dynamic variable a group of equations of vehicle motion characteristic of a desired vehicle by setting vehicle parameters appearing in said equations of vehicle motion equal to desired values representing said desired vehicle,

steering angle determining means connected with said target determining means for determining a desired value of a first wheel steering angle of said first wheels required to achieve said desired value of said dynamic variable, by solving for said steering angle a group of equations of



vehicle motion characteristic of said controlled vehicle using said desired value of said dynamic variable and actual values of vehicle parameters representative of said controlled vehicle,

actuating means for steering said first wheels so that an actual first wheel steering angle is maintained equal to said desired value of said first wheel steering angle,

actual vehicle behavior sensing means for sensing an actual value of said dynamic variable of said controlled vehicle, and

parameter adjusting means connected with said steering angle determining means for adjusting said actual value of at least one of said vehicle parameters used by said steering angle determining means in accordance with said actual value of said dynamic variable sensed by said actual behavior sensing means.

4,690,432

AUTOMOBILE INSTRUMENT CLUSTER TILTABLE WITH A STEERING COLUMN

Toshinori Sakamoto, Higashihiroshima; Isao Hirashima, and Seiichi Tsuji, both of Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 23, 1985, Ser. No. 790,515

Claims priority, application Japan, Oct. 24, 1984, 59-223167; Oct. 24, 1984, 59-160800[U]; Nov. 5, 1984, 59-168107[U]

Int. Cl.[4] B62D *1/18*

U.S. Cl. 280—775 **6 Claims**

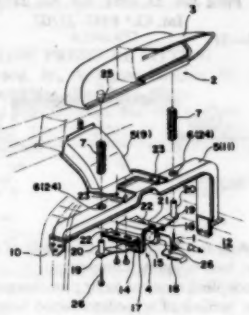
1. A support of an automobile gauge cluster on a steering column, having a steering shaft rotatably extending therein, for permitting a steering wheel to tilt up and down, which support comprises:

vertically extending connecting strut members provided for connecting said gauge cluster with said steering column;

a generally elongated bracket rigidly connected at one end to a portion of an automobile body structure located forwardly of a driver's seat in said automobile body structure and extending rearwardly of the vehicle therefrom;

a steering support bracket for supporting the steering column, said steering support bracket being connected with another end of the elongated bracket so as to extend in a widthwise direction of the automobile body structure; and,

guide hole means provided in the steering support bracket for receiving said vertically extending connecting strut members therein to permit the gauge cluster to undergo a



tilting motion in response to the tilting of the steering wheel.

4,690,433

STATIONERY SET

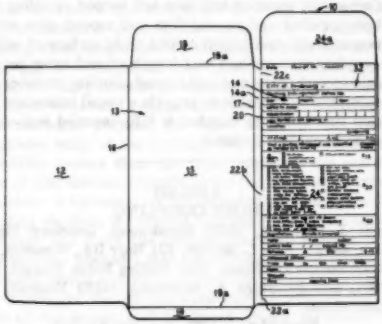
David F. Showers, Malvern; Raymond A. James, Balleen, both of Australia, assignors to Glenwood Systems U.S.A., Ltd., Australia

Filed May 29, 1985, Ser. No. 738,755

Claims priority, application Australia, May 30, 1984, PG5270

Int. Cl.[4] B42B *15/00*; B41L *1/20, 1/24*; B65D *27/00*

U.S. Cl. 283—1 B **9 Claims**

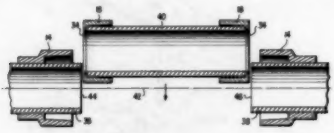


1. A mailable business single sheet form requiring only single entries producing a retained record page and a notice page foldable into an envelope sealed by the addressor which comprises a first page having printed indicia and cooperating blank spaces to be filled in by the person giving the notice, an underlying second page having indicia and blank spaces registering with the first page, means reproducing entries in the blank spaces of the first page of the blank spaces of the second page, a third page hinged to one of said first and second pages having an address printed thereon, gummed flaps on at least one of the hinged together pages to close the pages into an envelope with the address and entries exposed on opposite faces of the envelope, a projecting tab on a page receiving the entries to provide the record page, and means for separating the envelope forming pages from the record page.

4,690,434
PIPE COUPLING

Victor P. Schmidt, 12304 N. Ledges, Roscoe, Ill. 61073

Filed Jan. 23, 1981, Ser. No. 227,938
Int. Cl.[4] F16L *21/02*
U.S. Cl. 285—31 7 Claims



1. A coupling for joining the open ends of first and second pipe sections, said coupling comprising:

(a) a first coupling member having an elongated portion with an outer surface of a predetermined length and an inner diameter larger than the outer diameter of said first pipe section, a flange element extending radially inward and terminating at a circular recess, said flange element having an inner surface for limiting sliding of said first coupling element on the end of said first pipe, said flange element having an outer surface which extends in a plane from said outer surface of said first coupling member to said circular recess,

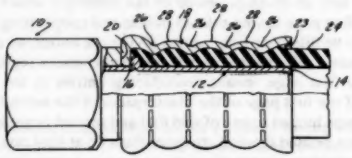
(b) a second coupling member having a first portion with an inner diameter larger than the outer diameter of said second pipe, a second portion having a recess of a predetermined length and of a diameter larger than the outer diameter of said first coupling member for sliding thereover and a surface extending radially from said inner diameter of said first elongated portion to the inner diameter of said second elongated portion for engaging said outer surface of said flange element to limit sliding movement of said second coupling member on said first coupling member, and

(c) means for securing said first and second coupling members together and to said first and second pipe sections respectively, said length of said outer surface of said first coupling member and said length of said inner recess of said second portion of said second coupling member being substantially the same to provide a visual indication when said first coupling member is fully inserted into said seconed coupling member.

4,690,435
HOSE COUPLING

Thomas J. Manning, 20135 Brookwood, Dearborn Heights, Mich. 48127; Jack L. Ritzert, 831 Burr Rd., Wauseon, Ohio 43567; Joseph D. Blouin, 1400 Rolling Ridge, Sturgis, Mich. 49091, and Josephine A. Mowinski, 24553 Bashian, Novi, Mich. 48050

Filed Mar. 7, 1986, Ser. No. 837,187
Int. Cl.[4] F16L *33/20*
U.S. Cl. 285—256 2 Claims



1. In a hose coupling of the type wherein an end section of a hose is inserted coaxially between an inner sleeve and an outer sleeve and the outer sleeve in subsequentially radially crimped at axially spaced locations to circumferentially clamp the hose end section against the inner sleeve;

the improvement wherein said hose coupling comprises a fitting including an elongate hollow tubular inner sleeve fixedly projecting from one end of said fitting to a distal end, said distal end of said inner sleeve having an annular outwardly convex curved surface, means defining a radially outwardly projecting annular flange on an inner sleeve adjacent said one end of said fitting, said inner sleeve having a smooth continuous cylindrical outer surface extending from said flange to said distal end, an elongate hollow tubular outer sleeve of uniform wall thickness coaxially mounted upon said inner sleeve, a radially inwardly projecting annular lip at one end of said outer sleeve radially overlapping and seated against the side of said flange adjacent said one end of said fitting, said outer sleeve extending from said flange to an outer end substantially aligned with said distal end of said inner sleeve, a hose having an end section coaxially received between said inner and outer sleeves with the end of said end section engaged with said flange and said lip, means defining at least four annular reduced diameter circumferentially crimped sections at uniformly spaced locations between the opposite ends of said outer sleeve, said crimped sections having an internal diameter less than the normal outer diameter of said hose to circumferentially clamp said hose against said smooth cylindrical outer surface of said inner sleeve at least four axially spaced locations, said crimped sections being separated from each other by outwardly bulged intermediate sections having a maximum internal diameter greater than that of the normal outer diameter of said hose, the outer end of said outer sleeve terminating at an outwardly flared end section having an annular chamfered inner edge radially spaced from the hose, the outer diameter D of such outer sleeve adjacent said annular lip is greater than the maximum diameter of said outwardly bulged inner portions and the maximum diameter of said flared end section is approximately equal to D.

4,690,436
PIPE COUPLING

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed May 28, 1985, Ser. No. 738,469
Claims priority, application Fed. Rep. of Germany, May 29, 1984, 3419999
Int. Cl.[4] F16L *19/00*
U.S. Cl. 285—321 10 Claims

1. A pipe coupling adapted for use as a repeatedly disconnectable and reconnectable union between two pipe ends or a pipe end and a wall port of a hydraulic system which is capable of sustaining elevated hydraulic pressures, the pipe coupling comprising in combination:

a first coupling member in the form of a pipe end portion having a cylindrical outer diameter and an inner axial extremity with an inner end face;

a second coupling member in the form of a body with an axially outwardly open bore into which the first coupling member is insertable, inner extremity first, the second coupling member having a female thread in the outer axial end portion of said bore;

a clamping member in the form of a sleeve having a bore which rotatably supports the clamping member on the outer diameter of the first coupling member, the clamping member having a male thread which can be screwed into the female thread of the second coupling member to create an axial inward movement of the clamping member;

an annular groove in the pipe end portion and a split snap ring arranged in the annular groove in such a way that it protrudes from the groove by approximately one-half of its radial height;

an axial recess in the bore of the clamping member, on the

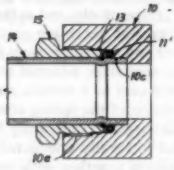
inner axial side thereof, the axial recess having a diameter accomodating the engaged snap ring, the clamping member having an axially inwardly facing shoulder cooperating with the protruding portion of the snap ring to transmit an axial inward movement of the clamping member to the first coupling member;

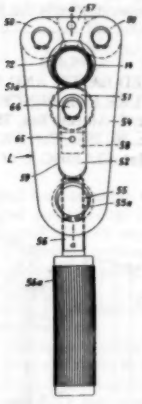
an annular gasket which is confined and compressed within an annular gasket chamber formed between said first and second coupling members and the clamping member; and

a pressure ring arranged between the inner extremity of the clamping member and the annular gasket; and wherein

the bore of the second coupling member includes a first cylindrical bore portion on the axially inner side of said female thread, said first bore portion surrounding the outer diameter of the pipe end portion with an annular gap, so as to define concentrically spaced outer and inner walls of said gasket chamber;

the bore of the second coupling member further includes a





second, smaller cylindrical bore portion adjoining said first bore portion on its axially inner side, the second bore portion cooperating with the cylindrical outer diameter of the pipe end portion to define a first displacement interface of minimal radial clearance;

the bore of the second coupling member further includes an annular face between said first and second bore portions defining the inner axial side of the gasket chamber;

the pressure ring has an axially inwardly facing pressure face defining the outer axial side of the gasket chamber;

the inner diameter of the pressure ring forms an interface of minimal radial clearance with the outer diameter of the pipe end portion, and the outer diameter of the pressure ring cooperates with the first bore portion of the second coupling member to form a second displacement interface of minimal radial clearance; and

the resultant axially shortenable gasket chamber encloses the annular gasket on all sides in such a way that, even under elevated compression forces exerted on the gasket by the gasket chamber walls and by high-pressure fluid contained inside the pipe coupling, extrustion of the gasket material between the constituent surfaces of the gasket chamber is precluded.

4,690,437

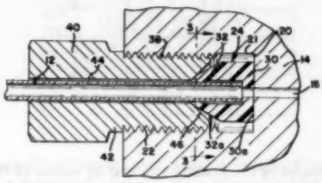
LOW PRESSURE FITTING

James M. Anderson, Jr., Arlington Heights, Ill., assignor to Alltech Associates, Inc., Deerfield, Ill.

Filed Feb. 27, 1986, Ser. No. 834,003

Int. Cl.[4] F16L *17/02*

U.S. Cl. 285—356 **6 Claims**



1. A fitting for connecting in pressure-tight fluid sealing relationship a tubing end to a fluid conducting member having a pressurizable fluid port terminating in a counterbore having an end wall surrounding said port, a cylindrical side wall and a threaded portion extending outwardly from said side wall; said fitting comprising a ferrule of resisilent deformable material having a forward portion, the outer diameter of which is substantially greater than the outer diameter of the tubing and substantially less than the diameter of the fluid conducting member counterbore and which has an end surface on said forward portion configured to mate with and sealingly engage the end wall surrounding the port, and a rearward portion which is rearwardly tapered, said ferrule having a throughbore with its diameter at least through said rearward portion being sufficient to receive and surround the tubing end; a fastener having a threaded portion for threadedly engaging the threaded portion of said fluid conducting member counterbore and having a throughbore for receiving the tubing, the throughbore being outwardly tapered at the forward end of said fastener to present conical walls for axially engaging said ferrule rearward portion, the taper angle of the conical throughbore walls at the forward end of said fastener being substantially greater than the taper angle of the rearward portion of said ferrule; whereby when the threaded portion of said fastener is tightened on the threaded portion of the fluid conducting member, the conical forward walls of said fastener will engage and force the tapered rearward portion of the ferrule laterally inwardly into sealing engagement around the surrounded tubing end only at approximately the point the tubing enters the ferrule rearward portion and the forward portion of the ferrule will be forced axially forwardly into sealing engagement with the counterbore end wall surrounding the port of said fluid conducting member and in such a sealing engagement said ferrule will be out of contact with the side wall of the counterbore.

4,690,438

FLANGE CONNECTION

Thaddaeus-Anton Kanczarek, Spardorf, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Dec. 17, 1985, Ser. No. 810,317

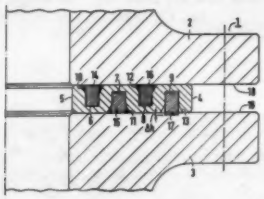
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3445975; Dec. 2, 1985, 3542593

Int. Cl.[4] F16L *23/00*

U.S. Cl. 285—363 **10 Claims**

1. A flange connection with a disc-shaped base body of incompressible material disposed between mutually facing

planar sealing surfaces of flanges which are to be assembled and connected to one another, the base body being formed with a central bore having a diameter matching an inner diameter of the flanges and formed with at least one annular slot, comprising a compressible sealing insert formed of expanded graphite and received in the annular slot, said sealing insert, after the flanges are assembled, being enclosed on all sides by



defining surfaces of the annular slot and by means of the sealing surfaces of the flanges in which said sealing insert, before assembly and connection of the flanges, is higher than the depth of the annular slot by an amount Δh, so that when said sealing insert is compressed, with the flange engaging the base body and taking into account the spring-back resilient properties of said sealing insert, said sealing insert has a compression of more than 100 N per mm^2.

4,690,439

MECHANISM FOR OPENING AND CLOSING A DOOR OF A HOME ELECTRIC EQUIPMENT, PARTICULARLY A ELECTRONIC RANGE

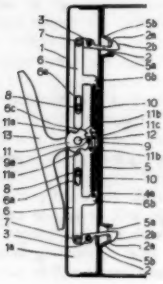
Jong D. Park, Changwon, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed May 23, 1986, Ser. No. 866,368

Claims priority, application Rep. of Korea, May 24, 1985, 6162/1985[U]

Int. Cl.[4] E05C *3/34*

U.S. Cl. 292—27 **1 Claim**



1. A mechanism for opening and closing a door of a home electric equipment, particularly an electronic range, comprising:

a pair of locking levers each pivotablely mounted, at the middle portion thereof, on the inner side wall of the door and provided, at one end thereof, with a locking portion having an engaging step and an inclined surface;

a locking plate fixedly mounted on a front wall of a body of said electronic range and provided with a pair of openings each adapted to receive the corresponding locking portion of said locking lever and a pair of engaging extensions each adapted to engage with said engaging step of the locking lever so as to maintain the door at a locked position thereof when the door is closed;

a pair of actuating levers each pivoted, at one end thereof, on the other end of said locking lever by means of a pin and provided, at the middle portion thereof, with a slot receiving a pin fixed on the inner side wall of the door and guiding the movement of said actuating lever, and provided with a lateral extension at a position between said slot and the pin connecting said locking lever and said actuating lever;

a pair of springs arranged between respective lateral extension of said actuating levers and adapted to urge said actuating levers in a direction that each locking lever is maintained at a locking position thereof;

a spring connector connecting said springs and having a protrusion;

a circular cam pivoted on a pin fixed to the inner side wall of the door and adapted to effect the movement of said actuating levers by the pivoting movement thereof, said cam having, at upper and lower portions thereof, a pair of cam surfaces each contacting with said other end of the actuating lever, respectively, and at the inner side thereof, an arc-shaped groove receiving said protrusion of the spring connector and respective steps formed at both ends of said groove, said steps adapted to limit the pivoting movement of the cam to a certain range by cooperating with said protrusion of the spring connector; and

a T-shaped handle disposed outwardly from the outer wall of the door and integrally connected with said cam, so that said cam pivots together with said handle when the handle turns in either direction of clockwise or counterclockwise, as an operator pulls the handle.

4,690,440

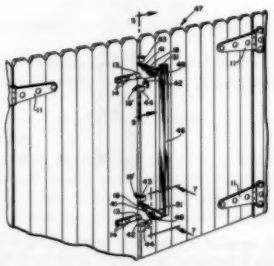
STRENGTHENED LATCH AND STRIKER BAR STRUCTURE FOR FENCE GATES

Gerald H. Rogers, Rte. 1, Athens, Tex. 75751

Filed Dec. 30, 1985, Ser. No. 814,312

Int. Cl.[4] E05C *3/14*

U.S. Cl. 292—54 **16 Claims**



1. A gate latch and striker bar structure comprising: latch striker bar means with a striker bar extension mountable on a pivotally mounted gate panel pivotal into open and closed states; a gate latch with a latch mounting back plate mountable on a fence gate member and having a striker bar receiving opening with a rear end that absorbs striker bar closing impact directly with closing of said gate panel; a pivotal latch member pivotally mounted on said latch mounting back plate for pivotal movement up and down; pivotal mounting means pivotally mounting said pivotal latch member on said latch mounting back plate; pivotal latch member pivot position limiting means mounted on said latch mounting back plate; cam surface means on said pivotal latch member engageable by said latch striker bar to lift said pivotal latch member as said gate panel is being moved to the closed state after which the pivotal latch member drops down to a latched state with the gate panel in the closed state; a downward facing opening enclosing said

striker bar extension in the latched state in said pivotal latch member having a rear edge recessed back from the rear end of said striker bar receiving opening to prevent contact of said rear edge with said latch striker bar as said gate panel is being pivoted to the closed state insuring that the back plate absorbs striker bar closing impact directly rather than such impact being imposed on the pivotal latch member and on said pivotal mounting means; and wherein said pivotal mounting means is a pivot screw extended through a pivot opening in said pivotal latch member, and threaded into a threaded opening in said latch mounting back plate; and wherein said pivotal latch member pivot position limiting means includes, a limit screw threaded into a threaded opening in said latch mounting back plate; and a slot in said pivot latch member with opposite slot ends coming into engagement with said limit screw to limit pivotal movement of said pivot latch member about said pivot screw.

4,690,441

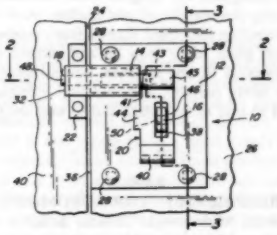
SHROUDED SLIDE LOCK ASSEMBLY

Anthony Fazzolari, and Nicholas Fazzolari, both of Brooklyn, N.Y., assignors to Myron Siegel, Brooklyn, N.Y.

Filed Sep. 25, 1985, Ser. No. 779,482

Int. Cl.[4] E05C 5/02

U.S. Cl. 292—57 **4 Claims**



1. A shrouded slide bolt lock assembly which comprises:

(a) a plate to be secured near the edge of a door;

(b) an exposed shroud guide directly secured to and projecting from said plate with an end portion having an aperture projecting over an edge of said plate;

(c) a staple secured to said plate;

(d) a slide bolt mounted in said shroud guide having endwise and rotatory movement therein;

(e) a hasp secured at right angle to one end of said slide bolt;

(f) a bracket secured to a wall frame so that when the door is closed the end portion of said exposed shroud guide will cover said bracket allowing said slide bolt to manually enter said bracket and aperture in the end portion of said shroud while said hasp will coact with said staple, and

(g) a bushing rotatively mounted on said slide bolt between said exposed shroud guide and said hasp to prevent tampering and cutting of said bushing and said slide bolt therein.

4,690,442

LOCATION MEANS FOR FREIGHT CONTAINER DOOR LOCKING ASSEMBLIES

Kenneth Reynard, Thirsk, United Kingdom, assignor to George Blair Public Limited Company, England

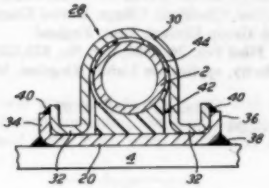
Filed Dec. 2, 1985, Ser. No. 803,572

Claims priority, application United Kingdom, Dec. 3, 1984, 8430474

Int. Cl.[4] E05C 9/08

U.S. Cl. 292—218 **3 Claims**

1. Location means for a freight container door locking assembly having a locking bar of circular cross-section, the location means comprising a backing member including a substantially plate-like portion having a rear surface adapted to be secured against the surface of the door of the container, the locking member further including a front surface shaped to receive therein part of the cirular section of the locking bar of the assembly and a pair of opposed, upstanding sidewalls having upper ends thereto, and a saddle bracket having a body portion of substantially U-shape in transverse section and a pair of opposed reflex edge regions of generally U-shape in transverse section, the edge regions of the saddle bracket being



located laterally within the upstanding sidewalls of the backing member to engage the front surface of the backing member such that the body portion of the saddle bracket, together with the shaped front surface of the backing member, define a substantially cylindrical guide channel for the locking bar, the free edges of the bracket lying closely adjacent the upper ends of the associated sidewalls of the backing member and being welded thereto at locations remote from the door.

4,690,443

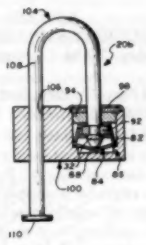
LOCKING DEVICE WITH SPLIT COLLAR

Terrence N. Brammall, Angola, Ind., assignor to Trans-Guard Industries, Inc., Angola, Ind.

Continuation of Ser. No. 500,323, Jun. 2, 1983, abandoned. This application Apr. 25, 1985, Ser. No. 727,601

Int. Cl.[4] B65D 33/34

U.S. Cl. 292—307 R **11 Claims**



1. A locking device comprising:

an elongate member having on one end a neck portion of a first diameter supporting a head of a second diameter greater than said first diameter to define a shoulder therebetween; and

a lock body securable to said elongate member, said lock body including

a body member having an annular recess therein,

a retainer fixed to said body member to overlie said recess and having a hole therethrough at least as large as said second diameter,

first and second locking jaws within said recess and movable between a first position providing an opening of said first diameter and a second position providing an opening of said second diameter,

said locking jaws defining bottom surfaces substantially perpendicular to said elongate member when secured to said lock body,

means for supporting said locking jaws above the bottom of said recess, and

means for biasing said locking jaws toward said first position, whereby said locking jaws bottom surfaces abut against the elongate member shoulder when the elongate member and lock body are secured together.

4,690,444

SECURITY SEAL WITH RUPTURABLE WALL

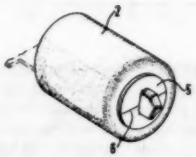
Frank H. Arthur, Chelsfield Village, United Kingdom, assignor to Envopak Group Limited, Kent, England

Filed Feb. 26, 1986, Ser. No. 833,020

Claims priority, application United Kingdom, Mar. 11, 1985, 8506229

Int. Cl.[4] E05B *39/02*

U.S. Cl. 292—324 **9 Claims**



1. A security seal of the type having internal means for non-detachable locking therein comprising a flexible strip, a locking box attached to a first end of the strip, and a free, second end of ths strip being insertable through an entry slot in the locking box for non-detachable locking therein, characterised in that an indicating member is arranged inside the box adjacent a rupturable wall thereof so that, when locking of the free end of the strip is effected, the indicating member is caused to rupture the wall and thereby provide visible evidence of locking.

4,690,445

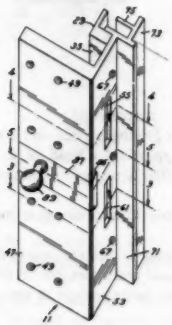
SECURITY STRIKER PLATE

Richard A. Hartley, 25834 Continental Cir., Taylor, Mich. 48180

Filed May 27, 1986, Ser. No. 866,748

Int. Cl.[4] E05B *15/02, 17/00*; E05C *1/04, 19/06*

U.S. Cl. 292—341 **11 Claims**



1. A security striker plate for a locking means upon a door hinged within a door jamb, including an upright rail, a peripheral door stop and interior framing studs;

comprising an elongated mount plate inset within a portion of the upright rail and bearing against its inner surface; said mount plate being located in a plane which is parallel to the plane of the door when closed;

a first series of longitudinally spaced elongated first screws arranged in a pair of laterally spaced rows extending through said mount plate and into the framing studs for anchoring the mount plate thereto;

an elongated right angular apertured strike plate intergral with and extending from said mount plate bearing against a right angular surface of the upright rail and facing the door when closed;

a second series of longitudinally spaced elongated second screws arranged at right angles to said first screws extending through said strike plate and threaded into said studs;

an enlongated right angular door stop lip integral with and extending outwardly from one side of said strike plate in registry with and reinforcing the door stop;

an elongated anchor plate integral with and projecting from said door stop lip at right angles thereto, registering with an outer portion of the door jamb;

a third series of longitudinally spaced tamper proof third screws extending through said anchor plate and threaded into said studs, and extending parallel to said second screws;

a first elongated fin integral with and in registry with said door stop lip and extending rearwardly of said strike plate to prevent tampering with said second screws; and

a second elongated fin integral with, extending along and projecting rearwardly of said anchor plate outwardly of and protecting said third screws from tampering;

said mount plate, door stop lip and second elongated fin being parallel to one another, said strike plate and said anchor being parallel, and said first elongated fin being parallel to said mount plate and to said second elongated fin.

4,690,446

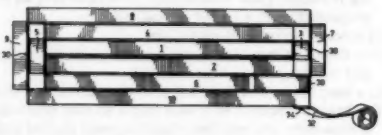
BUMPER STRIP FOR AUTOMOBILES

Monty Warren, Mississauga, Canada, assignor to Dorfender Products Inc., Mississauga, Canada

Filed May 30, 1986, Ser. No. 869,019

Int. Cl.[4] B60R *19/14, 19/42*

U.S. Cl. 293—128 **5 Claims**



1. A foldable add-on side protection device for automobiles and the like, comprising:

an elongate strip of impact-absorbing resilient material,

backing material in strip form surface-attached to the resilient material.

the strip of resilient material being separated into a plurality of sections of various lengths while the strip of backing material is continuous across each location where the resilient material is separated, thereby to allow the device to be wound upon itself in a compact spiral, the sections into which the strip of resilient material is separated comprising in sequence, beginning from one end;

(a) a first section having a first length,

(b) a second section having a length substantially the same as said first length,

(c) a third section having a length substantially the same as a width of the side protection device taken perpendicular to the surface between the resilient and the backing strip, and

(d) a fourth section having a length substantially the same as the first length,

means on the resilient material and on the backing material for detachably connecting to each other adjacent portions of the device when in the wound up condition,

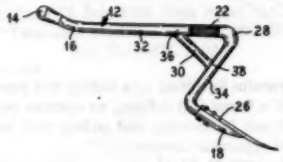
and magnetic means attached to the protection device, whereby the first, second and fourth sections, when wound, are parallel, and the third section is perpendicular thereto, in abutment to an end of the first section.

4,690,447

RAISED GRIP SHOVEL

Michael Adams, 3954 Dundee Rd., Northbrook, Ill. 60062

Continuation of Ser. No. 748,503, Jun. 25, 1985, abandoned.
This application Dec. 10, 1986, Ser. No. 941,534
Int. Cl.[4] B25G 1/10
U.S. Cl. 294—57 **1 Claim**



1. A shovel comprising a substantially Z shaped handle bar and a scoop blade having a leading edge and a back edge, said scoop blade attached to said handle bar adjscent said back edge at a connection area, said handle bar having a proximal portion, an intermediate portion and a distal portion, said distal portion attached to said scoop blade, a hand grip at a proximal end of said proximal portion, said proximal portion extending from said hand grip to an angled junction to said intermediate portion, said intermediate portion being angled with respect to said proximal portion such that when said proximal portion is substantially horizontal said intermediate portion extends backwardly under said proximal portion, said intermediate portion terminating in said distal portion, said distal portion located under said proximal portion and projecting forwardly of a junction with the intermediate portion, a hand grip area associated with sid proximal portion adjacent the junction between said proximal portion and said intermediate portion, the angle of the junction of the intermediate portion to the proximal portion being great enough whereby a hand may grip said proximal portion at the hand grip area adjacent to the junction to the intermediate portion with clearance for the hand between an under surface of the proximal portion and an upper surface of the intermediate portion underlying the proximal portion, said scoop blade projecting from said intermediate portion at an angle such that when said proximal portion is horizontal, said blade projects from said intermediate portion forwardly of the intermediate portion and downwardly from the horizontal, said hand grip area substantially overlying the connection area between the distal portion and the blade.

4,690,448

CONSOLE BOX FOR AUTOMOBILE

Naoki Fujisawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

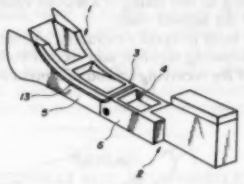
Filed Jul. 14, 1986, Ser. No. 885,156
Claims priority, application Japan, Jul. 16, 1985, 60-108605
Int. Cl.[4] B60R 7/04
U.S. Cl. 296—37.8 **6 Claims**

1. A console box for an automobile, split longitudinally into front and rear blocks, said console box comprising:

upwardly and downwardly projecting strips engaged with each other at the ends of opposed upper walls of the front and rear blocks;

an extension projecting toward one of said blocks from a side wall of the other of said blocks;

a cutout portion in said one block corresponding to the extension at the side wall of said other block; and



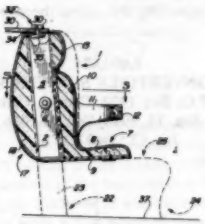
a platelike seat projecting from the side wall of said one block, said seat contacting the inner surface of the side wall of said other block when said blocks are coupled together.

4,690,449

ROTATING CHILD'S SEAT

Tommy E. Holman, 8974 Marlow St., Shreveport, La. 71118

Filed Jan. 23, 1986, Ser. No. 821,856
Int. Cl.[4] B60N 1/12
U.S. Cl. 296—65 R **17 Claims**



1. A rotating child's seat for vehicles having a storage area and at least one bench seat with a cooperating backrest, said rotating child's seat comprising seat means adapted to support a child, an opening provided in the bench seat for receiving said seat means and pivot means carried by the bench seat, said pivot means engaging said seat means near the center of said seat means in transverse relationship, and an access panel having one end carried by said vehicle and the opposite end of said access panel engaging said seat means and latch means carried by said access panel for securing said opposite end of said access panel to said seat means, whereby said seat mens is selectively rotated on said pivot means throug an arc of substantially 180° into a first functional orientation over the bench seat in the vehicle and into a second stored configuration in the storage area of the vehicle responsive to manipulation of said latch means to release said opposite end of said access panel from said seat means and open said access panel.

4,690,450

VISOR SYSTEM

Edward T. Boerema, Zeeland; Michael J. Suman, and Dennis J. Fleming, both of Holland, all of Mich., assignors to Prince Corporation, Holland, Mich.

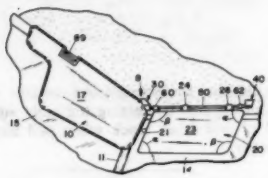
Filed Nov. 2, 1984, Ser. No. 667,765
Int. Cl.[4] B60J 3/02
U.S. Cl. 296—97 K **4 Claims**

1. A pair of mounting brackets for mounting opposite ends of first and second visors to a vehicle, said brackets comprising:

a first body having integrally formed therein a semi-cylindrical, longitudinally extending socket for releasably holding a clip of a first visor, said first body adapted to be mounted to a vehicle such that the axis of said socket extends generally in parallel relationship to the longitudinal axis of the

first visor said first body further integrally including an aperture formed therein on an axis which is generally parallel to and in offset relationship with said socket for receiving an end fitting of a second visor for supporting an end of the second visor;

a second body integrally including a generally circular aperture extending through said second body along a first axis thereof for receiving an end of a pivot elbow rod of a first



visor for permitting the first visor to pivot about the first axis of said second body, said second body further including a second aperture extending into said second body on a second axis generally orthogonal to and offset from said first axis for receiving an end fitting of a second visor for permitting the second visor to pivot about the second axis; and

means for mounting said brackets in spaced relationship to a vehicle for supporting the visors therebetween.

4,690,451

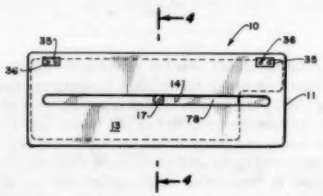
CONVERTIBLE SUN VISOR

Thaddeus Killar, P.O. Box 1922, Carmel, Calif. 93921

Filed Sep. 15, 1986, Ser. No. 906,926

Int. Cl.[4] B60J *3/02*

U.S. Cl. 296—97 G **13 Claims**



1. A convertible sun visor for an automobile adapted to be used as original equipment, when employed with an auxiliary mount means, and also adapted to be used an accessory sun visor by mounting thereof upon a preexistent sun visor, which comprises:

A. a generally rectangular housing having a rear wall, and a spaced therefrom front wall, said front wall having a longitudinal slot therein, and a pair of spaced connecting side walls, each of which has an vertically elongated cutout portion therein;

said housing being adapted to receive one of, auxiliary mount means for mounting said device on a preexistent sun visor or means for mounting as an original equipment sun visor;

B. a frame disposed within said housing, said frame having a rear wall, spaced top and bottom walls and a front wall, having a longitudinal slot therein, said frame being open at each end, and;

C. an elongated laterally adjustable light diminishing slider slidably mounted for longitudinal adjustment, both leftwardly and rightwardly, in said frame and sized to extend when extended through the side walls of said housing, said slider being adaptable to not impact upon the rear view mirror of a plurality of vehicles when in the rightwardly position;

D. a knob connected to said slider, said knob extending forwardly through the longitudinal slots in said housing and said frame.

4,690,452

SLIDING ROOF FOR VEHICLES

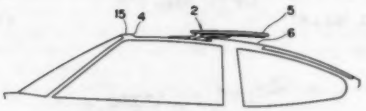
Toshiaki Niwa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 510,336, Jul. 1, 1983, abandoned. This application Feb. 10, 1986, Ser. No. 827,874

Claims priority, application Japan, Jul. 2, 1982, 57-115271

Int. Cl.[4] B60J *7/047, 7/057*

U.S. Cl. 296—216 **23 Claims**



1. An apparatus for tilting up a sliding roof panel (2) about a rear edge of a frame (22) defining an opening (4) in a vehicle roof (6, 15) and for moving said sliding roof panel (2) rearwardly, said apparatus comprising:

guide means (23, 31, 53, 31, 71) arranged on both sides of said opening (4); and

stay means, including front stays, (12, 52, 74) and rear stays (41, 41, 76), provided on said sliding roof panel (2);

said sliding roof panel (2) is supported at a front end thereof by said front stays (12, 52, 74) provided on both sides thereof and at a rear end thereof by said rear stays (41, 41, 76) provided on both sides thereof;

at least said rear stays (41, 41, 76) being supported by portions of said guide means (31, 31, 71), front ends of said portions (31, 31, 71) being hinged to said frame (22) and rear ends of said portions (31, 31, 71) being liftable;

said rear stays (41, 41, 76) being elevated when the rear ends of said portions (31, 31, 71) are lifted; and

each of said rear stays (41, 41, 76) having a rearwardly extending section which, when said sliding roof panel (2) has been completely moved rearwardly, is located over a section (6) of said vehicle roof (6, 15) adjacent a rear edge of said opening (4).

4,690,453

SLIDING ROOF FOR VEHICLES

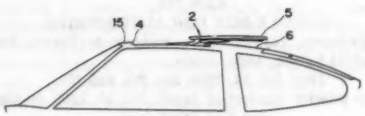
Toshiaki Niwa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 510,336, Jul. 1, 1983, abandoned, which is a continuation of Ser. No. 890,975, Jul. 30, 1986. This application Feb. 10, 1986, Ser. No. 827,876

Claims priority, application Japan, Jul. 2, 1982, 57-115271

Int. Cl.[4] B60J *7/047, 7/057*

U.S. Cl. 296—216 **20 Claims**



1. An apparatus for tilting up a sliding roof panel (2) about a rear edge of a frame (22) defining an opening (4) in a vehicle roof (6, 15) and for moving said sliding roof panel (2) rearwardly, said apparatus comprising:

guide means (23, 31, 53, 31, 71, 91) disposed on both sides of said opening (4); and

stay means, including front stays (12, 52, 74, 74) and rear

stays (41, 41, 76, 93), provided on said sliding roof panel (2);

said sliding roof panel (2) being supported at a front end thereof by said front stays (12, 52, 74, 74) provided on both sides thereof, and at a rear end thereof by said rear stays (41, 41, 76, 93) provided on both sides thereof; and

at least said rear stays (41, 41, 76, 93) are operatively connected to portions of said guide means (31, 31, 71, 91), and said portions (31, 31, 71, 91) being hinged at front ends thereof to said frame (22) and liftable at rear ends thereof by means of a rocker-type lever (37) which can be tilted by a tilting mechanism (36) arranged below a region (6) of said vehicle roof (6, 15) adjacent a rear edge of said opening (4).

4,690,454

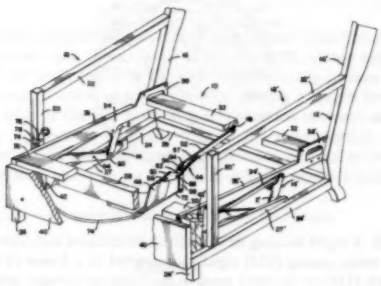
RECLINER UNIT WITH NOVEL LOCKING AND ACTUATING MECHANISM

Ned W. Mizelle, P.O. Box 5985, High Point, N.C. 27262

Filed Jun. 27, 1985, Ser. No. 749,409

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—89 **18 Claims**



1. A recliner, comprising,

a stationary frame having a back frame portion, a left side frame portion, and a right side frame portion,

a seat frame which is located between said side frame portions,

a leg rest which is located at a forward portion of the recliner,

a left recliner mechanism connecting the left side of said seat frame to the left side frame portion,

a right recliner mechanism connecting the right side of said frame to the right side frame portion,

each of said recliner mechanisms including a seat linkage means and a leg rest linkage means, said seat linkage means being operable to support said seat frame for movement relative to said stationary frame between a rear position and a forward position which has a greater pitch from the horizontal than said rear position, said seat linkage means including seat support links which are inclined rearwardly when the seat frame is in its rear position, said seat support links being inclined forwardly when the seat frame is in its forward position,

said leg rest linkage means being operable to support the leg rest for movement between a retracted position where it is generally vertical and an extended position where it is generally horizontal and extends in a forward direction,

a locking mechanism for holding the seat frame in its rear position at which said seat support links are inclined rearwardly, said locking mechanism being spaced from and located between the recliner mechanisms and having its opposite ends connected to the seat frame and to the stationary frame, said locking mechanism including pivotally interconnected links, one of which is a toggle member movable to an over center position where it prevents the links of the locking mechanism from pivoting relative to each other when the locking mechanism is subjected to longitudinal compressive forces, and unlocking means for moving the toggle member from its over center position so that the links of the locking mechanism are able to pivot relative to each other to enable the seat support links to move to positions where they are inclined forwardly and to enable the seat frame to move to its forward position, said unlocking means including a flexible tension member which, when pulled by a user of the recliner, causes the toggle member to move from its over center position.

4,690,455

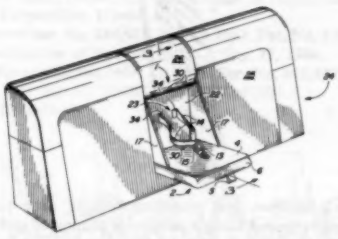
INFANT SEAT FOR AUTOMOBILES

Randal N. Bailey, 6011 Fox Chase Cir., Shreveport, La. 71106, and Purvis J. Crews, 4025 Marion Pl., Shreveport, La. 71109

Filed May 8, 1986, Ser. No. 860,896

Int. Cl.[4] A47C *15/00*

U.S. Cl. 297—238 **15 Claims**



1. An infant seat for automobilies comprising frame means disposed in the backrest of an automobile seat; a support hingedly carried by said frame means, wherein said support is selectively retractable in the backrest in a first orientation and deployed from the backrest in a second orientation; restraint means extending from a first point of attachment in said support to second points of attachment in said frame means; a first flexible side flap extending between one side of said support and the backrest of the automobile seat and a second flexible side flap extending between the opposite side of said support and the backrest of the automobile seat, said first flexible side flap and said second flexible side flap foldable in the backrest with said support when said support is retracted in said first orientation; ;and a first back support flap provided in recessed relationship inside the backrest of the automobile seat for supporting the back of the infant.

4,690,456

AIR BAG ASSEMBLY

Yoshinori Chiba, Yokosuka; Keiichi Ishida, Toyota, and Fumio Sugiura, Aichi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha; Toyota Jidosha Kabushiki Kaisha, both of Aichi and Kanto Jidosha Kogyo Kabushiki Kaisha, Kanagawa, all of, Japan

Filed Jun. 26, 1985, Ser. No. 748,860

Claims priority, application Japan, Jun. 27, 1984, 59-95369[U]

Int. Cl.[4] A47C *7/46*; B60N *1/06*

U.S. Cl. 297—284 **8 Claims**

1. A lumbar supporting air bag built into a seat back, comprising:

a main body consisting essentially of a resilient sheet of synethetic resin sealed together at side edges thereof;

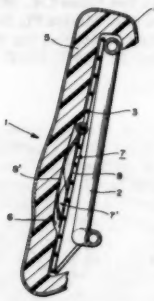
port means provided in said main body for introducing air into said main body and for withdrawing air from said main body;

a plurality of partitions formed in said sheet, said partitions being aligned substantially colinearly and extending transversely along said main body, said partitions being separated from one another and defining mutually communi-

cating upper and lower horizontal chambers in said air bag;

each of said partitions having longitudinally extending elongated holes at the center thereof, wherein opposing edge of said elongate holes separate from each other when air is introdued under pressure into the bag, in such manner that said elongate holes cause said upper and lower chambers to be outwardly expanded;

first and second plates sandwiching said air bag, said first plate having a plurality of apertures aligned with said lower chamber, said first and second plates each having a pair of mounting lugs for mounting said plates on said seat



back member, said mounting lugs of each pair being equally spaced along a peripheral portion of said first and second plates on a side of said upper chamber opposite from said lower chamber, said pairs of mounting lugs beig aligned with each other when said plates are mounted on said seat back member;

a resin sheet on the side of said first plate opposite said air bag, said sheet contacting said lower chamber of said air bag through said aperatures in said first plate, wherein the contacting surfaces between the sheet and said lower chamber of said air bag are joined for supporting the air bag on said plates.

4,690,457

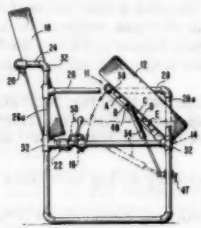
CHAIR WITH LIFT ASSISTANCE MECHANISM

Richard P. Poncy, Palm Beach Gardens, and Mathew Chrzanowski, West Palm Beach, both of Fla., assignors to Steridyne Corporation, Riviera Beach, Fla.

Filed Jul. 1, 1986, Ser. No. 880,928

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—337 **6 Claims**



1. A lift chair comprising:

a seat;

a frame supporting said seat and to which a front portion of said seat is pivotably attached, said frame having a central vertical frame member below said front portion of said seat;

a resilient compression cylinder having a first and second ends; and

means for selectably pivotably connecting said ends of said cylinder in a plurality of positions on said seat and said central vertical frame member of the chair frame, respectively, whereby the lifting force applied to said seat and the pivotal movement of said seat provided thereby are controlled.

4,690,458

RAPID LOCKING DEVICE FOR AN ARTICULATED SEAT

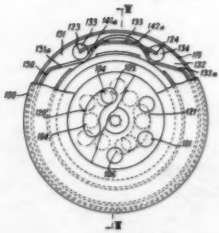
Yves Pipon, and Georges Droulon, both of Flers, France, assignors to A. & M. Cousin & Cie, Flers, France

Filed Jun. 10, 1985, Ser. No. 743,071

Claims priority, application France, Jun. 15, 1984, 84 09418; May 22, 1985, 85 07699

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—379 **4 Claims**



1. A rapid locking device for an articulated seat, comprising an outer casing (115) rigidly connected to a frame of the seat back (116) at an inner portion and having an outer peripheral portion, an outer dish (100) connected at an outer peripheral portion to said outer peripheral portion of said outer casing (115) to provide a space therebetween, a shaped casing (130) placed in said outer casing (115) and delimiting therewith a housing containing an inertia locking member, said inertia locking member comprising two rollers (133,134) each having a serrated outer surface and connected by a maintaining member (135), said shaped casing (130) shaped so that when said inertia locking member is subjected to an inertial force with respect to said housing, a respected one of said rollers rolls between respective surfaces of said outer casing (115) and said shaped casing (130) to prevent one from freely rotating with respect to the other, the device further comprising an articulation setting fitting (103) rigidly connected to a frame of the seat and the shaped casing (130) said shaped casing being able to rotate by means of the articulation setting fitting (103), said articulation setting fitting (103) having at least one protrusion (104) extending therefrom, and the outer casing (115) further having at least one elongate opening (120) cooperating with said at least one protrusion (104) to permit forward displacement of the seat back with respect to the seat.

4,690,459

WORKING CHAIR

Johan Ullman, Ånestadsgatan 3, S-582 58 Linköping, Sweden

Filed Oct. 17, 1985, Ser. No. 788,640

Claims priority, application Sweden, Oct. 19, 1984, 8405225

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—458 **4 Claims**

1. A chair comprising:

a stand having two uprights and a lower bow connected thereto for resting against a foundation, a foot rest provided on said uprights, said foot rest having outwardly extending pins and being positioned slightly above the

height which is necessary to allow a person's feet rest against the pins without pressure against the foundation;

a seat carried by said stand having an upwardly facing sitting surface provided with a resilient material giving a distribution of surface pressure, a textured surface covering provided on said sitting surface, said seat having on its upwardly facing sitting surface a rear portion and a front portion;

said rear portion being a substantially horizontal main surface having an effective length of substantially 10–15 cm;

said front portion being a second main surface which slopes forwards and downwards at an angle of substantially 16°–30° and preferably 18° with relation to the surface of the rear portion, said front portion having a length from the edge of the rear portion at a connection between said two portions to an outer edge of the front portion of substantially 23–30 cm, and being suitably adapted so that support is provided for ⅓ of the length of a person's thigh; and

a support for a person's back carried by said stand.

4,690,460

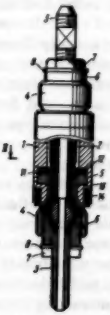
POWER UNIT

Jury A. Lebedev, Gorno-Altaisk, U.S.S.R., assignor to Gorno-Altaisky Gosudarstvenny Pedagogichesky Institut, Gorno-Altaisk, U.S.S.R.

Filed Oct. 25, 1985, Ser. No. 791,455

Int. Cl.⁴ E21C *37/06*

U.S. Cl. 299—21 **4 Claims**



1. A power unit, comprising:

a longitudinally split housing defining a parting line;

an inner wall of said housing;

a tubular elastic vessel coaxially accommodated in said housing;

an inner space of said tubular elastic vessel;

an outer wall of said tubular elastic vessel;

two expanding inserts, each of said inserts being disposed proximate to said parting line of said housing and being trapezoidal in section, the larger base of which bears against said outer wall of said elastic vessel, while the sides bear against said inner wall of said housing;

two pipe unions intended for delivery of a working medium into said space of said tubular elastic vessel;

two holders with two flanges in each of which is installed one of said two pipe unions which is configurated and mounted for longitudinal movement;

two ends of said tubular elastic vessel each of which is disposed between one of said two pipe unions and one of said two holders;

two annular recesses made on said inner wall of said housing;

a flange of each of said two holders arranged in one of said two annular recesses;

two elastic elements, each of which surrounds said outer wall of said tubular elastic vessel and arranged in one of said two annular recesses.

4,690,461

CUTTING HEAD FOR STRIP MINING APPARATUS

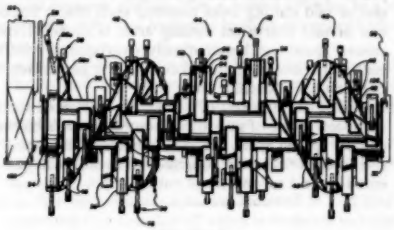
Richard H. Rink, Huron, S. Dak., assignor to Huron Manufacturing Corporation, Huron, S. Dak.

Division of Ser. No. 514,957, Jul. 18, 1983, Pat. No. 4,536,037 and a continuation of Ser. No. 651,422, Sep. 17, 1984.

This application Mar. 31, 1986, Ser. No. 845,952

Int. Cl.⁴ E02F *5/00*; E21C *47/00*

U.S. Cl. 299—39 **4 Claims**



1. A mining apparatus cutting head for loosening a contiguous mineral deposit into a disturbed composite, comprising:

a rotatable elongated axle member having first and second terminal ends and a longitudinal axis extending therebetween, said axle member presenting a generally cylindrical axle outer surface;

a first set of cutting arms extending radially outwardly from said axle outer surface, said first set of cutting arms being longitudinally and circumferentially spaced apart from each other to mutually define a first helix of given direction;

a second set of cutting arms extending radially outwardly from said axle, said second set of cutting arms being longitudinally and circumferentially spaced apart from each other to mutually define a second helix of opposite handed direction relative to said first helix;

a plurality of flighting elements, each element having a flighting surface and radially inwardly facing and radially outwardly facing, opposed margins, each of said flighting elements interconnecting respective ones of adjacent cutting arms in said first and second sets of cutting arms to present opposite handed flighting helices, the radially inwardly facing margin of each respective flighting element being radially spaced apart from said axle outer surface to present radially extending gaps between said flighting helices and said axle outer surface;

a third set of cutting arms interposed between said first and second sets of cutting arms, said third set cutting arms extending radially outwardly from said axle outer surface and being longitudinally and circumferentially spaced apart from each other such that adjacent ones of said third set of cutting arms define third set longitudinal gaps therebetween;

impelling elements operably coupled to and extending outwardly from said third set of arms, each of said impelling elements presenting a generally radially oriented impelling surface, the impelling elements of adjacent ones of said third set cutting arms being circumferentially spaced and longitudinally overlapping across said longitudinal gaps whereby said impelling elements mutually enscribe a continuous cylindrical surface upon rotation of said axle member for impelling said composite tangentially outwardly from said cutting head by said surfaces when said member is rotated;

a fourth set of cutting arms extending radially outwardly from said axle outer surface, said fourth set of cutting arms being longitudinally and circumferentially spaced apart from each other to define a third helix parallel to said first helix;

a fifth set of cutting arms extending radially outwardly from said axle outer surface, said fifth set of cutting arms being longitudinally and circumferentially spaced apart from each other to define a fourth helix parallel to said second helix;

each of said cutting arms of said first, second, fourth and fifth sets of cutting arms defining a generally uniform cutting arm width taken along said longitudinal axis, adjacent ones of said arms within said first, second, fourth and fifth sets of cutting arms being longitudinally spaced apart by no more than the distance of said cutting arm width to present longitudinal cutting arm gaps, said first and fourth sets of said cutting arms oriented such that a respective one of said fourth set cutting arms is circumferentially spaced apart, yet longitudinally overlapping relative to each respective longitudinal cutting arm gap presented by said first set of cutting arms; and

said second and fifth sets of cutting arms oriented such that a respective one of said fifth set cutting arms is circumferentially spaced apart, yet longitudinally overlapping relative to each respective longitudinal cutting arm gap presented by said second set of cutting arms.

4,690,462

CENTRAL LOCKING ARRANGEMENT

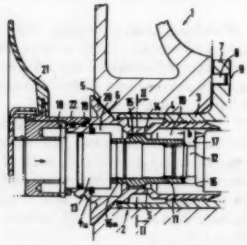
Manfred Bantle, Vaihingen, and Reinhard Lechner, Pforzheim, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 16, 1986, Ser. No. 819,342

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501240

Int. Cl.[4] B60B *27/00*

U.S. Cl. 301—9 CN **15 Claims**



1. A central locking arrangement for wheels of motor vehicles, comprising:

a centrally arranged threaded bush means operable to be connected with a joint shaft, said threaded bush means retainingly receiving a wheel under interposition of a wheel hub means,

an anti-rotation protecting sleeve means having an inner and outer end, arranged inside of the threaded bush means, said protecting sleeve means being engageable at its inner end with the joint shaft and retained in the bush means in a form-locking manner, said sleeve means being axially slideable within the bush means and axially movable with respect to the joint shaft while maintaining a form-locking arrangement with the bush means, and

a safety lock means adapted to be inserted and locked in the bush means, said sleeve means being form-lockingly connected at its outer end with the safety lock means.

4,690,463

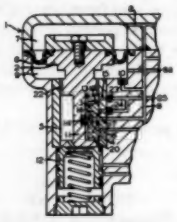
FREIGHT BRAKE CONTROL VALVE HAVING AN EMERGENCY PISTON SLIDE VALVE ARRANGED TO PROVIDE AN ACCELERATED BRAKE APPLICATION FUNCTION

James E. Hart, Trafford, Pa., assignor to American Standard Inc., Wilmerding, Pa.

Filed Apr. 18, 1986, Ser. No. 853,519

Int. Cl.[4] B60T *15/30*

U.S. Cl. 303—37 **17 Claims**



1. For use on each car of a railway train having a brake pipe interconnected to the brake pipe of an adjoining car, a control valve device operable in response to selective service and emergency rates of reduction of the pressure carried in said brake pipe for effecting either a service or an emergency brake application, said control valve device comprising:

(a) a housing having a cavity therein;

(b) an emergency piston in said cavity forming therewith first and second pressure chambers on opposite sides of said emergency piston, said first and second chambers being subject to said brake pipe fluid under pressure;

(c) a first choke via which said second chamber is communicated with said brake pipe;

(d) slide valve means carried by said emergency piston for effecting a reduction of the fluid pressure in said second chamber when said emergency piston is actuated in one direction in response to a pressure differential thereacross due to said selective reduction of the fluid pressure carried in said brake pipe, said reduction of said second chamber fluid pressure counteracting the selective reduction of said brake pipe fluid pressure effective in said first chamber, to such extent as to prevent said emergency piston from being actuated in said one direction sufficiently to establish an emergency brake application, so long as said selective reduction of fluid pressure carried in said brake pipe is at a service rate; and

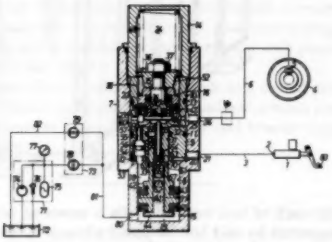
(e) said slide valve means in response to said actuation of said emergency piston in said one direction being effective for establishing a further reduction of said brake pipe fluid pressure in addition to said selective reduction of said brake pipe fluid pressure.

4,690,464

HYDRAULIC BRAKING PRESSURE CONTROL APPARATUS

Shohei Matsuda, Utsunomiya, and Yoshihiro Iwakawa, Haga, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Nov. 25, 1985, Ser. No. 802,120
Claims priority, application Japan, Jan. 24, 1985, 60-11699
Int. Cl.[4] B60T 8/14
U.S. Cl. 303—115 4 Claims



1. A hydraulic braking pressure control apparatus for vehicles, comprising:

a casing;

a first cylinder portion and a second cylinder portion disposed on the same axis inside the casing;

a partition interposed between the first cylinder portion and the second cylinder portion;

a first piston slidably fitted in said first cylinder portion defining an input hydraulic chamber, communicating with an output port of a master cylinder, on one side of said partition and a control chamber on the opposite side to said partition;

a second piston slidably fitted in said second cylinder portion defining on one side thereof nearest to said partition an output hydraulic chamber communicating with wheel brake and adapted to generate a hydraulic braking pressure corresponding to a hydraulic pressure in said input hydraulic chamber and a spring chamber on an opposite side thereof farthest from said partition;

said output hydraulic chamber being adapted to increase its volume in accordane with a control liquid pressure supplied from anti-lock control means to said control chamber when a wheel is about to be locked;

said first and second pistons being mounted to both ends of a piston rod penetrating through said partition and hydraulically sealed therewith and movably therethrough;

a valve mechanism provided in said partition and operable to be closed in response to the movement of said second piston away from said partition, thereby cutting off the communication between said input and output hydraulic chamber; and

a spring housed in said spring chamber for biasing said second piston toward said partition;

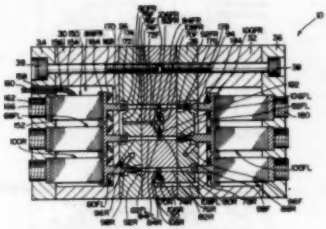
the sectional area of said first piston being smaller than that of said second piston so that the occurrence of a proportional pressure reduction action in said valve mechanism is avoided.

4,690,465

ANTISKID HYDRAULIC PRESSURE MODULATOR FOR VEHICLE HYDRAULIC BRAKING SYSTEM

Kenji Takeda, Nukata; Mitsuo Inagaki; Hideaki Sasaya, both of Okazaki, and Kazuma Matsui, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed May 21, 1986, Ser. No. 865,443
Claims priority, application Japan, May 22, 1985, 60-108333
Int. Cl.[4] B60T 8/00 8/36, 13/68, 15/02
U.S. Cl. 303—119 14 Claims



1. An antiskid hydraulic pressure modulator for adjusting hydraulic pressure applied from a master cylinder to a wheel cylinder of a vehicular hydraulic braking system, which comprises:

(a) a body having a main hydraulic passage for transmitting the hydraulic pressure from the master cylinder to the wheel cylinder and a pressure relief passage for relieving the hydraulic pressure in the wheel cylinder;

(b) a normally open first shutoff valve in said body for providing and interrupting fluid flow through said main passage;

(c) a first piezoelectric actuator received in said body for operating said first shutoff valve in response to variations in voltage applied thereto, said first piezoelectric actuator having and elongated piezoelectric element;

(d) a normally closed second shutoff valve in said body for providing and interrupting fluid flow through said relief passage; and

(e) a second piezoelectric actuator received in said body for operating said second shutoff valve in response to variations in voltage applied thereto, said second piezoelectric actuator having an elongated piezoelectric element.

4,690,466

SEWING MACHINE CABINET AND LIFT

Mamdouh M. Bakr, Little Rock, and Bobby J. Maloney, Trumann, both of Ark., assignors to Delta Wood Products, Inc., Trumann, Ark.

Filed May 30, 1986, Ser. No. 868,565
Int. Cl.[4] A47B 81/00
U.S. Cl. 312—29 17 Claims

1. A sewing machine cabinet and lift combination comprising:

a cabinet having a rear wall and a top wall, said top wall having an opening to permit movement of a sewing machine therethrough;

a platform having a top wall which is sized to pass through said cabinet top wall opening for receiving the sewing machine, and a rear wall attached to said top wall;

a vertical track secured to said rear wall of said cabinet, on the interior side thereof, said track having two pairs of vertical wall flanges, each pair comprising walls formed perpendicularly to each other;

a linear gear toothed rack secured to said track; roller means secured to said rear wall of said platform to rollingly engage said track, said roller means comprising pairs of

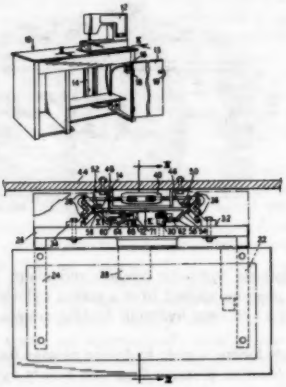
perpendicularly arranged rollers engagable with said track wall flanges;

an adjustment means on at least one pair of said roller means to ensure that engagement is maintained between said rollers and said wall flanges;

a reversible electric motor mounted on said platform;

a gear tooth pinion driven by said motor and engagable with said rack to move said platform vertically upon operation of said motor;

a switch operable through a circuit means to supply power



to said motor to move said platform along said track between a lower stored position and a normal operative position;

a switch operable through said circuit means to supply power to said motor to move said platform along said track between said normal operative position and an elevated position;

said circuit means including additional switches engagable by an actuator on said platform to interrupt power to said motor when said platform is at said lower, normal and elevated positions.

4,690,467

SECURITY ENCLOSURE HAVING ONE OR MORE COMPARTMENTS FOR HOUSING AND PROTECTING A WINDSURFER AGAINST THEFT

Louis Imbert, 3, rue Alphonse Daudet, Trebes, France (11800)

Filed Dec. 7, 1982, Ser. No. 447,621

Claims priority, application France, Dec. 9, 1981, 81 23334

Int. Cl.[4] A47B *81/00, 53/00*

U.S. Cl. 312—198 **16 Claims**

1. A security housing for storing elongated objects, such as a windsurfer which includes a wishbone, said housing comprising at least one compartment comprising:

(a) a door;

(b) means for locking said door;

(c) a top face having a first opening therein;

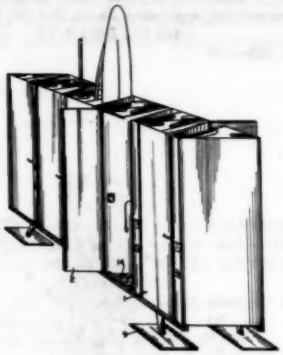
(d) two vertical walls which lie in intersecting planes, wherein said compartment is adapted to receive said wishbone having a length greater than the vertical height of said compartment, wherein the length of said opening as measured along the longitudinal axis of said opening is less than the largest width of said wishbone as measured along said longitudinal axis of said opening when said wishbone is properly positioned in said compartment so that a portion of said wishbone extends through said first opening;

(e) means for preventing said wishbone from being removed from said compartment, said wishbone removal prevention means including said opening;

(f) a coin-activated apparatus for locking and unlocking said locking means;

(g) a lower frame for supporting said compartment, including a plurality of hollow beams; and

(h) a plurality of hollow posts, mounted on said frame such



that each of said vertical walls is mounted between and supported by said hollow posts, wherein at least one post includes an opening in the front therein for receiving said coin-activated apparatus, wherein said post having said opening includes means for passing pieces of change away from said coin-activated apparatus.

4,690,468

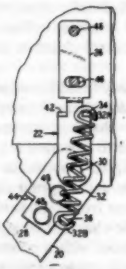
REVERSIBLE HINGE WITH OVER-CENTER SPRING FOR REFRIGERATORS

Robert G. Lau, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 26, 1986, Ser. No. 833,036

Int. Cl.[4] A47B *47/00*

U.S. Cl. 312—291 **6 Claims**



1. In a refrigerator having a single external door mounted on a cabinet and an inner freezer compartment door at an opening of a freezer compartment, an improved hinge comprising:

a stationary leaf for mounting to the refrigerator cabinet at a first side of said opening to said freezer compartment and alternately at a second side of said opening, said stationary leaf including first and second tabs extending therefrom in spaced apart disposition from one another;

a movable leaf for mounting to said freezer compartment door including third and fourth tabs extending therefrom in spaced apart disposition from one another, said movable leaf being mounted adjacent a first edge of said compartment door when said stationary leaf is at said first side of said opening and said movable leaf being mounted adja-

cent a second edge of said compartment door when said stationary leaf is at said second side of said opening;

a hinge pin pivotably connecting said stationary leaf to said movable leaf;

said movable leaf being pivotable to a first center position having said first tab and said third tab in-line with said hinge pin, said movable leaf being pivotable to a second center position different than said first center position, said second center position having said second tab and said fourth tab in-line with said hinge pin; and

an energy storing spring having a first end connected to one of said first and second tabs and a second opposite end connected to one of said third and fourth tabs, said spring biasing said movable leaf in a first pivotal direction with respect to said stationary leaf and when a predetermined movement of said movable leaf occurs past a respective one of said first and second center positions biasing said movable leaf in a second pivotal direction with respect to said secondary leaf;

whereby said first position corresponds to a closed position of said freezer compartment door and said second position corresponds to an open position of said freezer compartment door.

4,690,469

PANEL ADJUSTMENT DEVICE FOR THE FRONT PANEL OF DRAWERS OR THE LIKE

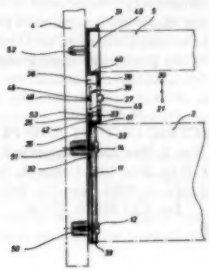
Alfred Grass, Konsumstrasse 20, A-6973 Hoechst/VLBG., Austria

Filed Jun. 27, 1985, Ser. No. 749,569

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423732

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—330 R **13 Claims**



1. In a panel adjustment arrangement for a front panel of a drawer, said drawer having frame pieces, front screw flanges, drawer guides and side walls, and wherein said front panel is connected to each frame piece by one of said screw flanges, adjustment of position between said front panel and frame piece being effected by a displaceable adjustment element; the improvement wherein the adjustment element includes a wedge shaped tongue having a first tongue surface positioned to press against a surface fixed to said front panel and a surface of said tongue positioned to lie against a surface of the respective screw flange, said tongue between said screw flange and said front panel producing an adjustment gap therebetween, and a mounting in which said adjustment element is movably constrained, said mounting having a U-shaped cross-section including a base and two sides, at least said adjustment gap between said front panel and said screw flange being covered by at least one said side, said sides of said U-shaped cross-section laterally guiding movement of said adjustment element.

4,690,470

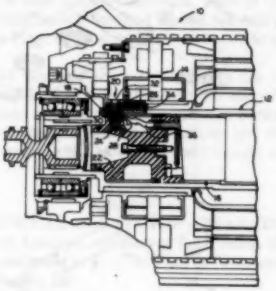
ROTATING SHAFT ELECTRICAL CONNECTION

Howard L. Hayden, Rockford; Vallabh V. Vaghani, Belvidere, and John Readman, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 12, 1986, Ser. No. 862,318

Int. Cl.[4] H01R *39/02*

U.S. Cl. 439—13 **6 Claims**



1. In an electrical apparatus having a hollow rotating shaft, said electrical apparatus having an electrical component disposed externally of said rotating shaft and adapted to rotate therewith and said electrical apparatus having an electrical component disposed internally of said rotating shaft and adapted to rotate therewith, said externally disposed electrical component adapted to be electrically interconnected through an opening in said rotating shaft to said internally disposed electrical component, the improvement comprising:

means for electrically interconnecting said electrical components through said rotating shaft opening, said interconnecting means including an insulator fixed within said hollow rotating shaft in proximity to said rotating shaft opening and an insert disposed within said insulator in alignment with said rotating shaft opening, terminal means of low resistance and high conductivity associated with each of said electrical components in spaced relation thereto and having an opening adapted to receive a fastener on opposite sides of said rotating shaft opening, conductive sleeve means of low resistance and high conductivity extending through said rotating shaft opening and spaced from said rotating shaft so as to be in electrically isolated relation thereto, and a fastener extending through said rotating shaft opening and operatively associated with said insert for electrically interconnecting said electrical components through said terminal means and said conductive sleeve means.

4,690,471

RF INTERCONNECT WITH TRIAXIAL SELF-ALIGNMENT

Eduardo J. Marabotto, Miami, and Mark S. Bresin, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 19, 1986, Ser. No. 864,239

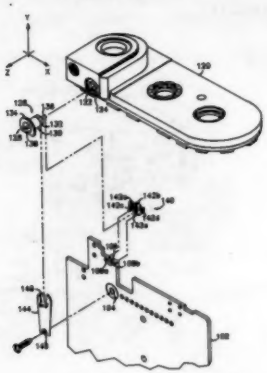
Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—63 **6 Claims**

1. A triaxial self-aligning interconnect for connecting a circuit substrate to a connector, said interconnect comprising in combination:

a wire conductor formed into five segments: two flexible attaching segments formed at the ends of said wire for attaching said wire conductor to said substrate, two substantially parallel pin contact segments adjoining said flexible attaching segments, and a joining segment mutually connecting said pin contact segments; and

a substantially straight pin attachable to said connector, said pin being clamped between and substantially perpendicular to said pin contact segments of said wire conductor, thereby forming an electrical connection between said pin and said wire conductor;



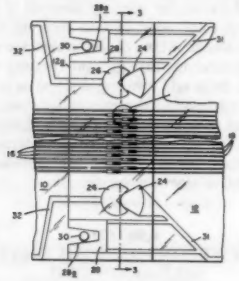
whereby, substantial misalignment of said substrate and said connector is permitted in any direction without breaking said electrical connection.

4,690,472

HIGH DENSITY FLEX CONNECTOR SYSTEM

Richard A. Elco, Mechanicsburg, Pa., and Hugh R. Vandegriff, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 26, 1986, Ser. No. 911,679
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—67 **4 Claims**



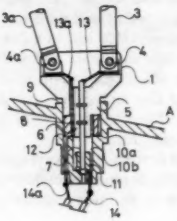
1. In a system for connecting a photodefined array of connector pads on a printed wiring board with a matching array of photodefined connector contact fingers and squeezing the connector into contact with the printed wiring board that includes a squeeze clamp for the connector and the printed wiring board, means for aligning said connector fingers as the connector fingers are guided into an overlapping position with said pads within said clamp comprising: a photodefined first guide located at each side of the array of connector pads; and a photodefined second guide located at each side of the array of fingers, said first and second guides intermeshing as said connector fingers are guided into said overlapping position to precisely align said fingers with said pads.

4,690,473

ROTARY COUPLING FOR ROTATIVELY CONNECTING A FEEDER LINE TO A ROD ANTENNA

Bong-Kwan Chung, Keumsan-kun, Rep. of Korea, assignor to Sam Sung Electronics Co., Ltd., Suwon Kyungki-do, Rep. of Korea

Filed Aug. 22, 1986, Ser. No. 899,410
Claims priority, application Rep. of Korea, Aug. 22, 1985, 85-10727[U]
Int. Cl.[4] H01R *39/00*
U.S. Cl. 439—1 **4 Claims**



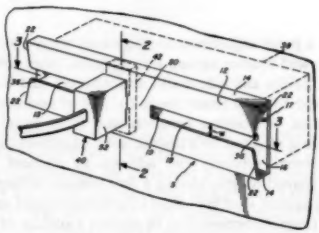
1. A rotary coupling for rotatively connecting an antenna feeder line of a television set to a rod antenna, a wall of the set having a receptacle open at one end, comprising a rotatable antenna body having a plug received in said receptacle for rotation about its central axis, antenna rods pivotally connectable to said body, a pivot terminal fixed to said body and seated within said receptacle, a sleeve coupled to said body for rotation together therewith, a sleeve bearing in rotary engagement with said sleeve, said bearing being fixed against rotation within said receptacle, a pivot terminal holder in rotary engagement with said terminal and being fixed against rotation within said receptacle, a pair of wires of the feeder line being respectively connectable to said bearing and said holder, and said rods being respectively connectable to said terminal and said sleeve, whereby said body is capable of rotation about said central axis relative to said holder and said bearing for preventing any twisting of the feeder line during such rotation.

4,690,474

ELECTRIC OUTLET AND PLUG

Nancy M. Smart, Rte. 2, Box 238, Contoocook, N.H. 03229, and Ricky B. Smart, P.O. Box 238, Concord, N.H. 03301

Filed Apr. 3, 1986, Ser. No. 847,942
Int. Cl.[4] H01R *19/16*
U.S. Cl. 439—120 **19 Claims**



1. An electric wall outlet and plug, comprising:

a wall outlet having a top surface, sidewalls, and a bottom surface which define an interior passage, the top surface of said wall outlet having a lateral slot extending from the center to a longitudinal end of said top surface, a first electrical conductor secured to the bottom surface of said wall outlet, means for securing said first conductor to said

wall outlet, means for connecting said first conductor to a live electrical wire, and means for attaching said wall outlet to a wall; and

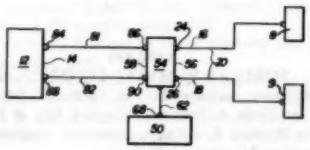
a plug having a base shaped and sized so as to slidably fit in said passage, a second electrical conductor secured to the bottom of said base, said second conductor contacting said first conductor, and a neck which extends upwardly from said base, said neck having a width less than the width of said slot, wherein said second conductor contacts said first conductor when said plug is slid in said passage from said longitudinal end of the wall outlet and plug being shaped so that said plug can only be inserted into said outlet in a direction parallel to the longitudinal axis of the outlet and not in a direction normal to said longitudinal axis.

4,690,475

COMPUTER HARNESS ADAPTIVE TESTER

Robert C. McElroy, 1061-B Jefferson Dr., Homestead, Fla. 33034

Filed Sep. 2, 1986, Ser. No. 902,691
Int. Cl.[4] H01R *11/00*
U.S. Cl. 439—502 **4 Claims**



1. A computer harness adaptive tester to be electrically interconnected between (a) the end of an electrical harness, which normally connects to a module on a vehicle, and (b) the electronic control module, said adaptive tester comprising:

(A) a coupler means, (B) a jumper means, (C) a remote pin-out box, and (D) a secondary harness interconnecting said coupler means and said remote pin-out box;

said jumper means including means interconnecting the coupler means and said control module, and

said secondary harness being of a length greater than two feet,

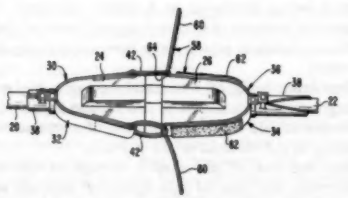
whereby testing of wires in the vehicle circuits may be conducted at a remote location without removal of the electronic control module from the vehicle and while the tester is temporarily and electrically interconnected between the harness end and its normal connection to the module.

4,690,476

ELECTRICAL CONNECTOR SECURING SYSTEM

Jali Morgenrath, Pfeiffer Ridge, Big Sur, Calif. 93920

Filed Oct. 30, 1986, Ser. No. 924,986
Int. Cl.[4] H01R *13/631*
U.S. Cl. 439—502 **18 Claims**



1. A system for coupling electrical cables, comprising:

first and second electrical connectors with matable electrical contacts mounted on the cables to be coupled;

a pair of first flexible straps secured at first ends thereof to said first connector and extending in a direction of a free end of said first connector, each of said first straps having a relatively rigid ring secured at an opposite second end thereof; and

a pair of second flexible straps secured at first ends thereof to said second connector and extending in a direction of a free end of said second connector, each of said second straps having mating first and second fastener parts separated by a hinge section adjacent an opposite second end thereof;

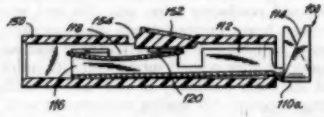
whereby said first and second connectors can be secured passing each said second strap through one of said rings such that said rings lie adjacent said hinge sections, folding said second straps at said hinge sections, and then attaching said fastener parts of each of said second straps.

4,690,477

ELECTRICAL CONNECTOR APPARATUS

Ray C. Doutrich, Lebanon, and George T. DeShong, East Berlin, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 729,162, Apr. 30, 1985, Pat. No. 4,616,415. This application Apr. 25, 1986, Ser. No. 856,003
Int. Cl.[4] H01R *33/76*
U.S. Cl. 439—595 **5 Claims**



1. A partially pre-assembled electrical connector comprising:

a housing having a plurality of longitudinal, laterally adjacent, substantially parallel apertures, each aperture extending all the way through the housing between front and rear surfaces of the housing;

a plurality of flexible latches disposed on one side of said housing in corresponding one-to-one relationship with said apertures, each latch having a nose portion which extends into its associated aperture;

a longitudinal metal terminal partially inserted into each aperture at the rear surface of said housing in a direction substantially parallel to the longitudinal axis of the associated aperture, each terminal having a front disconnect portion with a downwardly bowed spring member and an uncrimped rear wire portion, the disconnect portion being disposed in the aperture and at least a portion of the wire crimp portion being outside the housing to the rear of the rear surface, the nose portion of each latch being in biased contact with the bowed spring member of the disconnect portion of the associated terminal to a degree sufficient to retain said terminal position against inadvertent withdrawal but not sufficient to permanently latch said terminal in the housing.

4,690,478

SEALED ELECTRICAL CONNECTOR ASSEMBLY

Thomas F. Rahrig, Antwerp, Ohio, and Thomas E. Hall, Fort Wayne, Ind., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

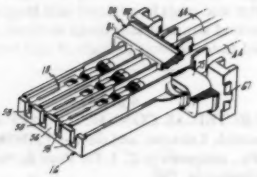
Filed Apr. 10, 1986, Ser. No. 850,460
Int. Cl.[4] H01R *4/00*
U.S. Cl. 439—271 **10 Claims**

1. In a connector assembly comprising at least one terminal having a conductor wire joined thereto and extending therefrom, a terminal holder, the terminal being mounted in the

terminal holder, a connector housing having an interior cavity and an opening therein communicating with said cavity, the terminal being operatively disposed within the connector housing cavity and the conductor wire extending through the housing opening, and sealing means for preventing moisture from intruding to the connector housing cavity via said connector opening, the improvement wherein:

the terminal holder includes a support surface for at least supporting a longitudinal portion of the conductor wire; and

the sealing means comprises first and second resilient sealing members, the first sealing member being interposed between the terminal holder support surface and said portion



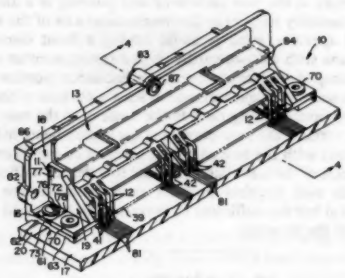
of the conductor wire, in engagement with said conductor wire and said second sealing members being annular and encircling both said terminal holder and said portion of the conductor wire in at least partial longitudinal coincidence with said first sealing member and in engagement with said conductor wire, said first and second sealing member being cummulatively so contoured and sufficiently resilient as to sealingly engage said portion of the conductor wire around substantially its entire perimeter, and the outer periphery of said second sealing member being in continuous sealing engagement with an interior surface of the connector housing at the opening therein, thereby to seal the opening.

4,690,479

FILTERED ELECTRICAL HEADER ASSEMBLY

Robert D. Hollyday, Elizabethtown, and Patrick F. Yeager, Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 10, 1985, Ser. No. 786,392
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—97 **22 Claims**



1. A filtered electrical connector comprising:

a housing means having at least one cavity therein, said housing means including a front housing portion and a rear housing portion, one of said housing portions including a pair of flange portions, each having an aperture extending therethough;

a conductive grounding plate supported between said front and rear housing portions, said grounding plate having a plurality of apertures therein for receiving a plurality of tubular filter elements in conductive contact with said grounding plate, said grounding plate further including a pair of integral grounding flanges, said grounding flanges each having an aperture extending therethrough, said apertures being aligned with corresponding apertures in said housing flange portions;

a plurality of electrical terminal members, each extending through a respective tubular filter element in conductive contact with its respective tubular filter element, said members being supported with said housing means and said tubular filter elements being mechanically and electrically secured in said filter receiving apertures of said grounding plate; and

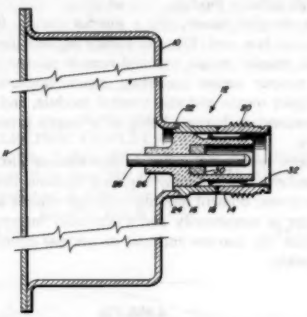
conductive means comprising a first fastening means extending through each of said aligned apertures in said grounding plate flanges and said housing portion flanges for connecting said grounding plate to said housing portion and a second fastening means extending through said first fastening means for providing means for mounting said connector to a circuit board, and a grounding path from said grounding plate through said conductive means to said circuit board.

4,690,480

TUBULAR BI-METAL CONNECTOR

Wayne R. Snow, Jacksonville, Fla.; Gaston R. Isliker, Sidney, N.Y., and Colin A. Johnson, deceased, late of Jacksonville, Fla. (by Barbara F. Johnson, executor), assignors to Allied Corporation, Morristown, N.J.

Filed Sep. 26, 1985, Ser. No. 780,536
Int. Cl.[4] H01R *13/504*
U.S. Cl. 439—364 **6 Claims**



1. An electrical connector adapted to be secured to a housing by welding, comprising,

an outer shell;

electrical contact means supported within and insulated from said shell;

said shell being fabricated as a unitary structure from a composite laminate of first and second layers of distinctly different materials which have been explosively bonded together;

said first layer being of a material having a higher shear strength than the material of said second layer,

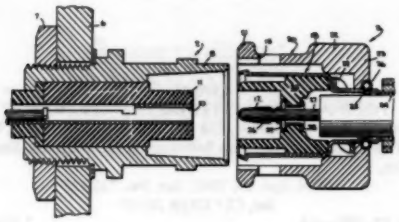
the material of said second layer being of a type suitable for welding to the material of the housing,

whereby one end of said shell is formed of the material composing said first of said layers of laminate and the opposite end of said shell is formed of the material composing said second of said layers of laminate.

4,690,481
COAXIAL COUPLING

Walter J. Randolph, R.D. 3, Hill Rd., Crawford County, Saegertown, Pa. 16433

Continuation of Ser. No. 377,617, May 13, 1982, abandoned. This application Dec. 26, 1985, Ser. No. 813,530
Int. Cl.[4] H01R 17/18
U.S. Cl. 439—585 1 Claim



1. In an improved plug for a coaxial connector wherein an electrical connection is made between a pin in the plug and a contact in a connector socket the improvement comprising:

a hollow forwardly opening plug shell;

a hollow forwardly opening insulator disposed and gripped within said plug shell;

a pin within the hollow of said insulator and having a hollow interior and being firmly attached to said insulator at a rear wall of said insulator hollow opening which is intermediately disposed longitudinally between ends of said insulator, said pin hollow interior opening rearwardly from said insulator rear wall for receiving a conductor and said pin hollow interior extending to the forward end of said pin within the hollow insulator;

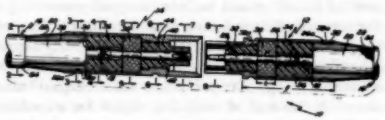
a crimped portion on said pin forwardly of the attachment of said pin to the rear wall of said insulator and being disposed in the forwardly opening portion of said insulator;

whereby the crimped portion electrically and mechanically attaches a conductor to said pin.

4,690,482
HIGH FREQUENCY, HERMETIC, COAXIAL CONNECTOR FOR FLEXIBLE CABLE

Roger R. Chamberland, Oakdale, and Andrew J. Stanland, Niantic, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 7, 1986, Ser. No. 881,366
Int. Cl.[4] H01R 17/18
U.S. Cl. 439—578 2 Claims



1. A coaxial connector for shieldably joining together one end each of a first and second flexible coaxial cable, each said cable having identical impedance and a diameter no greater than 0.375 of an inch, comprising:

plug means, fixedly attached to said first coaxial cable, for providing a male ended cable termination having an impedance corresponding to said first coaxial cable, said plug means further comprising a first hollow, cylindrical body having a cable end and a connector end and first and second coaxial internal bores of different diameter, such that said first bore of smaller diameter extends a preselected depth into said first body from said connector end and said second bore of larger diameter extends a preselected depth into said first body from said cable end, a first internal body shoulder being formed where said first and second bores meet, a first cylindrical metal pin, concentrically positioned within said first body, said first pin having a length substantially greater than the diameter thereof and an undercut of preselected length formed thereupon at a preselected location along the length thereof thereby forming first and second pin shoulders, and further having first and second tapered ends, said first tapered end aligning with said first body connector end and said first pin shoulder aligning with said first body shoulder, for providing an electrically conducting path therethrough, a first fused glass cylindrical insert, having a preselected thickness, a cable end surface, a connector end surface and a dielectric constant, said first insert being heat fused to said second bore, said first body shoulder and said first pin undercut, for providing axial open-face pressure strength and hermetically sealing said plug means, a first cylindrical plastic insulator, press fit on said connector end of said pin and contacting the periphery of said first bore and the connector end surface of said first insert, a first metal sleeve, slideably engaging said second tapered end of said first metal pin and soldered to the central conductor of said coaxial connector, for providing electrical conduction therebetween, a second cylindrical plastic insulator, positioned within said first body over said first sleeve and contacting said second bore, contacting the cable end surface of said first insert and contacting the cable dielectric, for providing an impedance matching that of said cable, and a first tapered metal adapter, inserted within and fixedly attached to said second bore and being soldered to the outer metal braid of said coaxial cable, for providing support for said braid and electrical conductivity; and

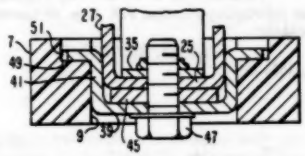
receptacle means, fixedly attached to said second coaxial cable, for providing a female ended cable termination having an impedance corresponding to said second coaxial cable;

said male and female ends being slideably engagable with one another such that when coupled together a coaxial, first cable-to-second cable joint is formed having a continuous impedance corresponding to that of said first and second coaxial cables.

4,690,483
TERMINAL BASE ASSEMBLY FOR METER SOCKETS

George M. Carris, Monroe, Conn., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1986, Ser. No. 913,878
Int. Cl.[4] H01R 9/18, 13/426
U.S. Cl. 439—517 8 Claims



7. A terminal assembly for a meter socket, comprising:

a jaw terminal for receiving a mating blade terminal for an electric meter;

an electrical conductor for conducting current to the jaw terminal;

a mounting clip for releasably and frictionally attaching the assembly to an insulating base of a meter socket, the clip having a flat base with an offset perpendicular side wall extending along opposite edges of said flat base and with a lateral flange extending from each side wall parallel to

said flat base and the clip being receivable by a hole in said insulating base with the side walls and flanges adapted to be in snug engagement with the surfaces forming the hole and a top surface portion of said insulating base, respectively, and said perpendicular side walls being in frictional engagement with perpendicular side walls of said jaw terminal.

4,690,484

WAFER AND METHOD FOR MANUFACTURING SWITCH WAFER

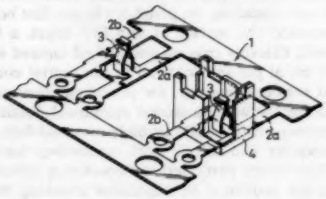
Hiroki Oba, Furukawa; Seiichi Aoki, Miyagi; Akira Niinuma, Furukawa, and Seiichiro Sato, Tajiri, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 26, 1985, Ser. No. 813,649

Claims priority, application Japan, Dec. 25, 1984, 59-275084

Int. Cl.[4] H01R *13/516*

U.S. Cl. 439—736 **3 Claims**



1. A method of manufacturing a switch body, having a clip contact held therein which is connected to a terminal member, comprising the steps of:

forming from an integral piece of plate material a hoop segment connected to a terminal member connected to a T-shaped clip portion;

bending the T-shaped clip portion back 180 degrees over the terminal member and then bending the T-ends of the clip portion uprightly substantially 90 degrees toward each other so as to form a clip contact extending upright with respect to said terminal member; then

insert-molding a box body made of insulating material such that the terminal member is molded at the bottom of the box body with the clip contact held upright in an enclosure defined in the box body.

4,690,485

FLAT BED OPTICAL SCANNING BEAM DEFLECTION SYSTEM

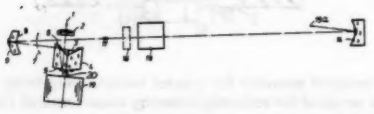
Michael Plaot, Eschborn, Fed. Rep. of Germany, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 20, 1985, Ser. No. 778,585

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1984, 3434841

Int. Cl.[4] G02B *26/10*

U.S. Cl. 350—6.5 **15 Claims**



1. In an optical laser beam deflection system of the type including rotating active reflective faces for generating a light scan, in combination with an imaging system for imaging, the improvement comprising optical means (2–8) provided in the light path before the imaging system (18) for enlarging the entrance angle (C) of the imaging system, and wherein not more than two rotating reflective bodies (4.5) are provided which are arranged in a pentaprism structure, each with one active reflective face, to thereby obviate effects of tilting relative to inclinations of the axis of rotation (20) during rotation thereof, and said bodies being positioned in the light path before said optical means.

4,690,486

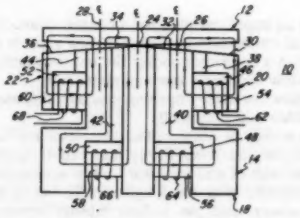
FOUR POSITION INTERLACING APPARATUS

Walter F. Roll, Blue Ridge, and Michael Campbell, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 29, 1985, Ser. No. 728,127

Int. Cl.[4] G02B *26/10*

U.S. Cl. 350—6.6 **7 Claims**



5. A multiple position interlacer comprising:

(a) an interlace mirror including magnetic material;

(b) a support body of magnetic material for supporting the interlace mirror, said support body including a surface having a plurality of surface segments sloping downwardly from a central ridge formed by adjacent surface edges, each surface segment having a sloping, flat surface forming a facet of a preselected interlace angle, a plurality of non-magnetic bars for dividing the support body into a plurality of magnetic cords beneath the facets and a plurality of coils mounted within the plurality of magnetic cores; and

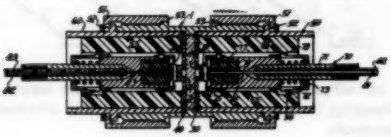
(c) an electrical control circuit means operatively connected to the plurality of coils for selectively energizing the coils to move the interlace mirror through preselected angles whereby a plurality of interlaced lines is formed of the energy impinging on the interlace mirror, wherein the control circuit means includes a signal generating means for sequentially producing first signals of a first polarity for selectively energizing the coils of the body support for selectively magnetizing the cores thereof and second signals of an opposite polarity, a second signal being produced at the end of each first signal for expediting the demagnetization of the corresponding core, wherein the signal generating means includes a clock means, logic circuitry operatively connected to the clock means for producing a plurality of control signals, and a switching means operatively connected to the logic control means for sequentially introducing current flowing in a first direction for energizing the coils a preselected time and then sequentially introducing current flowing in a second direction in the coils for deenergizing the coils a preselected time prior to turn off whereby the coils first energize the cores in a first direction followed by energization in a second direction prior to cutoff for expediting demagnetization of the coils.

4,690,487

HERMETICALLY SEALED FIBER OPTIC CONNECTOR

Charles S. Hale, Sidney; Andrew Matzkin-Bridger, Oneonta, and Ronald W. Morse, Sidney, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 14, 1983, Ser. No. 550,833
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.21 4 Claims



1. A hermetically sealed fiber optic connector for optically coupling separate optical fibers, said connector comprising:

a main housing having a central passage;

an optically transparent window located in the central passage, said window having first and second surfaces extending across said central passage;

a hermetic seal between said window and said housing;

a first member having a bore therein, said first member located adjacent to the first surface of said window;

a second member having a bore therein, said second member located adjacent to the second surface of said window, the bore of said second member axially aligned with the bore in said first member;

a first lens;

a second housing;

means for mounting said first lens in said second housing and said second housing to said main housing so that said first lens is axially aligned with the bore of said first member, said means for mounting said first lens axially aligned with the bore of said first member comprising a first insert attached to the window on the side of the first lens and having a bore therethrough of a size sufficient to receive and align the first lens axially with the bore of the first member, and said means further including means for receiving a first optical fiber in axial alignment with said first lens, and said means for receiving said first optical fiber in axial alignment with said first lens being a fiber end receiving slot in said first lens;

a second lens;

a third housing separably connected to the other side of said first housing;

means for mounting said second lens in said third housing and said third housing to said main housing so that said second lens is axially aligned with the bore of said second member, said means for mounting said second lens axially with the bore of the second member comprising a second insert attached to the window on the side of the second lens and having a bore therethrough of a size sufficient to receive and align the second lens axially with the bore of the second member, and said means further including means for receiving a second optical fiber in axial alignment with said second lens, and said means for receiving said second optical fiber in axial alignment with said second lens being a fiber end receiving slot in said second lens;

said second and third housings each including means for selectively coupling and uncoupling said second and third housings from said main housing; and

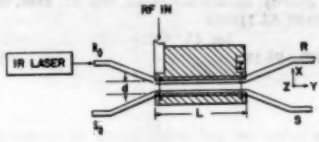
biasing means for biasing said first lens and second lens into tight abutment with said window.

4,690,488

COMPENSATION FOR OPTICAL DAMAGE OF DIRECTIONAL-COUPLER SWITCHES

Caroline M. Gee, Woodland Hills, and Gary D. Thurmond, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 3, 1984, Ser. No. 606,507
Int. Cl.[4] G02B 6/10
U.S. Cl. 350—96.12 21 Claims



1. An improved waveguide assembly, of a ferroelectric crystal material having a plurality of input and output ports transmitting electromagnetic energy, for use in an optical directional coupler switch, comprising ferroelectric crystal waveguides having stabilized indices of refraction resulting from the process steps of:

(a) applying electromagnetic energy in a wavelength range above the visible spectrum at a power level, at least approximately twice the normal operating level of the coupler switch, for a predetermined time period sufficient to saturate the change in the indices of refraction, to one waveguide input port, and

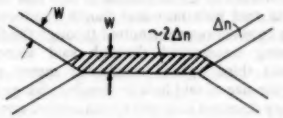
(b) applying electromagnetic energy in a wavelength range above the visible spectrum at a power level, at least approximately twice the normal operating level of the coupler switch, for a predetermined time period sufficient to saturate the change in the indices of refraction, to another waveguide input port whereby the optical switching characteristics are stabilized for subsequent electromagnetic energy transmission at a normal power operating level.

4,690,489

INTEGRATED OPTICAL WAVELENGTH MULTIPLEXER AND DEMULTIPLEXER DEVICE FOR MONOMODE TRANSMISSION SYSTEMS AND ITS USE

Antonius A. Neyer, Iserlohn, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Feb. 19, 1985, Ser. No. 702,523
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406207
Int. Cl.[4] G02B 6/10
U.S. Cl. 350—96.14 17 Claims



1. A wavelength multiplexer and demultiplexer device for combining radiation of wavelength λ_0 with radiation of wavelength λ_1, and for separating radiation of combined wavelengths λ_0 and λ_1 into radiation of wavelength λ_0 and separate radiation of wavelength λ_1, said device comprising:

a two-mode strip waveguide having first and second opposite ends and having a length L from the first end to the second end;

a first monomode strip waveguide optically coupled to the first end of the two-mode strip waveguide; and

second and third monomode strip waveguides optically coupled to the second end of the two-mode strip waveguide;

characterized in that the difference $\Delta\lambda$ between λ_0 and λ_1 is approximately equal to $n\pi/\gamma L$, where γ is the differential mode dispersion of the two-mode waveguide in the vicinity of λ_0, and where n is an odd integer.

4,690,490

LIGHT DIVERTING DEVICE

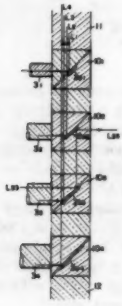
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,983

Claims priority, application Japan, Sep. 27, 1983, 58-178718; Nov. 16, 1983, 58-215809

Int. Cl.[4] G02B *6/28*

U.S. Cl. 350—96.15 **14 Claims**



1. A light diverting device comprising a first cylindrical optical conductor means having a longitudinal axis, said first conductor means having a first light-emission end surface which is inclined relative to said longitudinal axis, a second cylindrical optical conductor means having a longitudinal axis axially aligned with the longitudinal axis of the first conductor means, said second conductor means having a second light-receiving end surface which is inclined relative to the longitudinal axis of said second conductor means, said first inclined surface engaging said second inclined surface, said second conductor means having a receiving-passage opening up onto said second inclined surface, third optical conductor means disposed in said receiving-passage, said third optical conductor means having an opening means which defines a hole in said second inclined surface, a fourth optical conductor means having a longitudinal axis which is disposed transversely to the longitudinal axis of said first conductor means, said fourth conductor means having a light-receiving edge which conforms to and engages the outer cylindrical surface of said first conductor means at a position opposite to said hole such that light energy transmitted through the first conductor means is partially diverted by a first portion of said first inclined surface opposite to said hole into said fourth conductor means, the remaining light energy transmitted through the first conductor means being transmitted through said second conductor means, said third optical conductor means providing for changing the size of said hole to thereby change the amount of light energy diverted into said fourth optical conductor means.

4,690,491

BUILDING DATA TRANSMISSION SYSTEM

David E. Stein, St. Louis, Mo., and Donald R. Hammer, Waterloo, Ill., assignors to Southwestern Bell Telephone, St. Louis, Mo.

Filed Oct. 4, 1985, Ser. No. 784,565

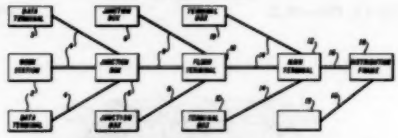
Int. Cl.[4] G02B *6/28*

U.S. Cl. 350—96.16 **19 Claims**

1. A fiber optic communications network for internal building data transmission having at least three data work station terminals which can communicate with each other but are not serially connected comprising:

(a) at least three junction boxes each of which is connected to at least one work station terminal through no more than two fibers;

(b) at least two floor distribution terminals to which at least two of said junction boxes are connected by fiber optic cable to different floor distribution terminals; and



(c) nonadhesive connector and jumper cable means for changing the pattern of the network at said distribution terminals.

4,690,492

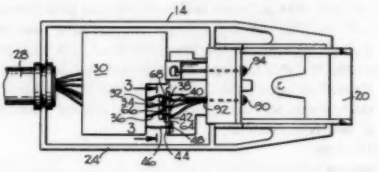
OPTICAL COUPLING

Robert W. Beard, Placerville, Calif., assignor to Oximetrix, Inc., Mountain View, Calif.

Filed Sep. 4, 1984, Ser. No. 646,794

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **10 Claims**



1. An optical coupling comprising

a substrate having a flat surface and a hole extending through the substrate to the flat surface,

an optical fiber extending through the substrate hole and fixed therein with an end face of the optical fiber located at a fixed position relative to the flat surface,

a deformable bracket made of electrically conductive material having a first portion mounted to the substrate and having a free end portion extending from the first portion and spaced from the substrate, said free end portion having a flat surface located generally parallel to the end face of the optical fiber, and

a light emitting diode mounted on the flat surface of the bracket adjacent the optical fiber end face,

said bracket being formed of a soft malleable metallic ribbon whereby the bracket can be deformed by force generally in the plane of the optical fiber end face so that the light emitting diode can be positioned to provide the maximum light energy to the optical fiber.

4,690,493

METHOD AND DEVICE FOR POSITIONING LIGHT-CONDUCTING FIBRES

Giok D. Khoe, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Apr. 28, 1983, Ser. No. 489,283

Claims priority, application Netherlands, May 12, 1982, 8201941

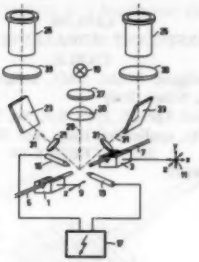
Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **4 Claims**

1. A method of visually positioning te end of a light conducting fiber, said fiber having a core and a cladding surrounding the core, said method comprising the steps of:

transversely irradiating a porting of the fiber with ultraviolet

light, said ultraviolet light having a wavelength such that it causes the core of the fiber to emit visible light; and



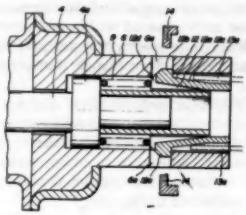
positioning the end of the fiber by observing the visible light emitted by the core.

4,690,494

FERRULE HOLDING DEVICE FOR OPTICAL FIBER CONNECTOR

Takao Hirose, and Norio Kumekawa, both of Shimotsuga, Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1985, Ser. No. 729,245
Claims priority, application Japan, May 7, 1984, 59-65497[U]
Int. Cl.⁴ G02B *6/36, 7/26*
U.S. Cl. 350—96.20 **8 Claims**



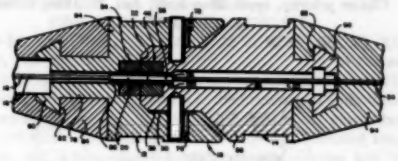
1. A ferrule holding device for an optical fiber connector, said connector including two connector bodies, a sleeve extending in said two connector bodies, and two ferrules respectively accomodating optical fibers therein to be aligned with each other when the ferrules are inserted in said sleeve in end-to-end relationship, said ferrules being urged by spring means so as to bring ends of said optical fibers into close contact with each other, said ferrule holding device comprising a spring urged sleeve consisting of a cylindrical body having an outer diameter somewhat smaller than an inner diameter of each said connector body, said cylindrical body being provided at plural locations with resilient curved pieces having hooks with the same thickness as the wall of said cylindrical body and having outer chamfered surfaces, said hooks being outwardly extending but depressible inwardly of an outer periphery of said cylindrical body, said resilient curved pieces being integral parts of said cylindrical body being formed such that said curved pieces are thinner than the wall of said cylindrical body with the bottom inside diameter of said parts on the same radius as the inside diameter of said cylindrical body, and said hooks being curved outwardly, and each said connector body being formed with anchoring apertures into which said hooks of said resilient curved pieces extend so as to hold said spring urged sleeve in said connector to support said spring means urging said ferrule.

4,690,495

OPTICAL FIBER MAGNETIC CONNECTOR

Gabriel M. Giannini, 51555 Madison St., Indio, Calif. 92120

Filed Nov. 14, 1984, Ser. No. 671,325
Int. Cl.⁴ G02B *6/38*
U.S. Cl. 350—96.21 **4 Claims**



1. A connector for optically coupling one end of a first fiber optic light guide to one end of a second fiber optic light guide which comprises:

a first generally tubular member having a first end opening shaped and dimensioned to engage the end of said first fiber optic light guide about a first axis common to said first tubular member and said first fiber optic light guide;

a first generally U-shaped magnet inserted into said first opening of said first tubular member and defining at least two magnetic poles of opposite polarities symmetrically disposed about a first plane containing said first axis;

a first cylindrical lens coaxially mounted into said first tubular member, said lens having an inner face in contact with the end of said first fiber optic light guide and an exposed outer face near an opposite second end opening of said first tubular member;

a second generally tubular member having a first end opening shaped and dimensioned to engage the end of said second fiber optic light guide about a second axis common to said second tubular member and said second fiber optic light guide;

a second generally U-shaped magnet inserted into said first opening of said second tubular member and defining at least two magnetic poles of opposite polarities symmetrically disposed about a second plane containing said second axis;

a second cylindrical lens coaxially mounted into said second tubular member, said lens having an inner face in contact with the end of said second fiber optic light guide and an exposed outer face near an opposite second end opening of said second tubular member;

the edge of the second end opening of said first tubular member defining at least one pair of helicoidal ramps, the ramps in said pair being symmetrically and diametrically opposite in relation to said first axis, said ramps together extending over the entire periphery of said second end opening of said first tubular member and the ends of said pair of ramps which are closest to the end of said first fiber optic generally falling on a first line orthogonal to said first axis;

the second end opening of said second tubular member being shaped and dimensioned to define at least one pair of contact points symmetrically and diametrically positioned in relation to said second axis, said contact points being commensurately positioned to ride on said ramps when the second end openings of said tubular members are brought together until said contact points reach the ends of said ramps, said points being on a second line oriented so that the angle defined by the first line and said first plane is equal to the angle defined by said second line and said second plane. and the poles of the first magnet are lined with the opposite poles of the second magnet when said contact points reach said ends; and

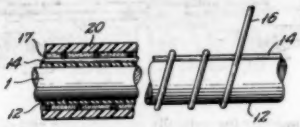
said second tubular lens is coaxially positioned within said second tubular member so that its outer face contacts the outer face of the first tubular lens when said points reach the ends of said ramps.

4,690,496

OPTICAL FIBER JOINT WITH REINFORCING FILAMENT AND METHOD OF MAKING SUCH JOINT

Bruno Bortolin, Cinisello Balsamo, and Sergio Borgonovo, Lomazzo, both of Italy, assignors to Societa Cavi Pirelli S.p.A., Milan, Italy

Filed Jan. 23, 1985, Ser. No. 693,772
Claims priority, application Italy, Jan. 27, 1984, 19341 A/84
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 **11 Claims**



1. A joint between two optical fiber cables, each cable comprising an optical fiber surrounded by a plurality of coverings, said joint comprising:

the end of the optical fiber of one said cable mechanically connected to the end of the optical fiber of the other said cable;

ends of said protective coverings axially spaced from each other and axially spaced from the connected ends of the optical fibers;

a protective layer of moisture impervious material around the connected ends of the fibers and extending axially on each side of said ends;

a plurality of non-metallic filaments on said protective layer and secured thereto by an adhesive, at least one of said filaments extending axially of the fibers and another of said filaments being wound around said fibers; and

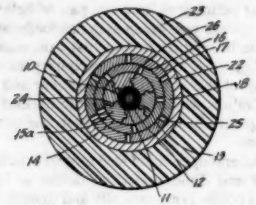
a layer of elastomeric material surrounding said filaments.

4,690,497

UNDERWATER OPTICAL FIBER CABLE WITH SEGMENTED PROTECTIVE TUBE

Elio Occhini, and Giuseppe Bianchi, both of Milan, Italy, assignors to Societa Cavi Pirelli, S.p.A., Milan, Italy

Filed May 24, 1985, Ser. No. 738,059
Claims priority, application Italy, May 29, 1984, 21158 A/84
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 **14 Claims**



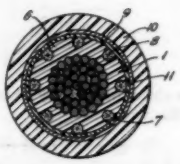
1. An underwater, optical fiber cable comprising an optical fiber core including one or more optical fibers, a pressure resisting tube surrounding said core, said tube being formed by a plurality of elongate wires of copper or aluminum and their alloys, each elongate wire having, in transverse section, substantially the shape of a sector of an annulus, a layer of helicoidally wound, elongate steel elements surrounding said tube and a tubular, water-tight conductive sheath surrounding said layer of said elements, wherein the improvement comprises providing said elements in the form of side-by-side elongate elements each of which has a quadrangular, transverse cross-section with the radial lengths of the radially extending sides thereof smaller than the peripheral lengths of the peripherally extending sides thereof.

4,690,498

PRESSURE RESISTANT SUBMARINE OPTICAL FIBER CABLE

Paolo G. Priaroggia, Milan, Italy, assignor to Societa Cavi Pirelli S.p.A., Milan, Italy

Filed Apr. 15, 1985, Ser. No. 723,039
Claims priority, application Italy, Apr. 19, 1984, 20621 A/84
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 **14 Claims**



1. A submarine, telecommunication cable comprising:

a core comprising an axially disposed and extending armor formed by a strand of wires and a layer of plastic material around and adhering to said strand, said plastic layer having a plurality of spaced-apart, helical grooves therein extending longitudinally of said core and opening radially outwardly and said strand of wires having, by itself, a tensile strength sufficient to withstand the tensile stresses to which the cable is subjected during laying and recovery thereof;

a substantially incompressible fluid disposed in and filling-up otherwise empty spaced within said layer of plastic material including any spaces between said wires;

at least one optical fiber loosely received in each of said grooves;

a substantially incompressible fluid disposed in and filling-up any othwise empty spaces in said grooves; and

a water-tight metal sheath around said core, said sheath, by itself, having a resistance to compression which is insufficient to withstand the compression forces to which the cable is subjected during use;

said cable being without armor externally of said layer of plastic material which, by itself, can withstand the mechanical stresses to which the cable is subjected in use;

whereby said cable is able to withstand hydrostatic pressures to which it is subjected when submerged without any armor outwardly of the optical fiber or fibers which by itself can withstand such pressures.

4,690,499

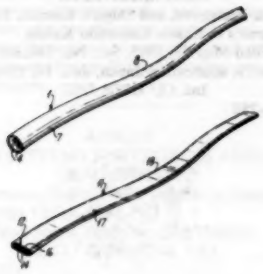
OPTICAL FIBRE ELEMENT HOUSED IN A TUBE RESILIENTLY SET IN A FORM SUCH THAT ITS LONGITUDINAL AXIS FOLLOWS A PATH GREATER THAN THE RECTILINEAR DISTANCE BETWEEN POINTS TO BE CONNECTED

John E. Taylor, Maidenhead, and Ian W. Keene, London, both of England, assignors to BICC Public Limited Company, London, England

Filed Mar. 13, 1985, Ser. No. 711,247
Claims priority, application United Kingdom, Mar. 14, 1984, 8406635
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 **21 Claims**

7. An optical fibre element comprising a flexible tube having a bore in which at least one optical fibre is loosely housed, wherein the tube is resiliently set in such a form that the central longitudinal axis of the tube follows a path of smoothly curved undulations whose axes of curvature lie parallel to one another

and substantially normal to the longitudinal axis of the tube, the arrangement being such that, when the undulating flexible tube is subjected to a longitudinally applied tensile force, the tube will tend to straighten in a lengthwise direction against



the action of the undulating resilient set thereby to reduce the tensile force applied to the or each optical fibre and, when the tensile force is removed, the tube will return under the action of its undulating resilient set towards its original form.

4,690,500

OPTICAL MULTIPLE FIBER

Hiroyuki Hayami, Itami, and Atsushi Utsumi, Kawanishi, both of Japan, assignors to Dainichi-Nippon Cables, Ltd., Hyogo, Japan

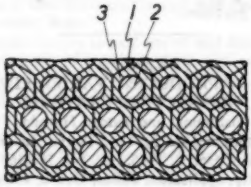
PCT No. PCT/JP83/00057, § 371 Date Nov. 1, 1983, § 102(e) Date Nov. 1, 1983, PCT Pub. No. WO83/03144, PCT Pub. Date Sep. 15, 1983

PCT Filed Feb. 26, 1983, Ser. No. 556,234

Claims priority, application Japan, Mar. 1, 1982, 57-32559

Int. Cl.⁴ G02B *6/06*

U.S. Cl. 350—96.25 **16 Claims**



1. An optical multiple fiber comprising a plurality of optical fibers which are fused together with each other, each optical fiber comprising a core made from pure silica glass and which has a substantially circular cross-section and a cladding layer disposed directly on the core and made of a dopant-containing silica glass having a lower refractive index than the pure silica glass of the core, said cladding layer having a thickness which satisfies the following equation (I):

$$2D_1 \geqq T_1 \geqq 1.0\ \mu m \qquad (I)$$

wherein T_1 is the thickness of the cladding layer in μm and D_1 is the diameter of the core in μm and $T_1 \leqq D_1$; the difference in refractive index between the core and the cladding layer being from 0.008 to 0.016 and the diameter of the optical multiple fiber being 5 mm or less.

4,690,501

ULTRAVIOLET CURABLE OPTICAL GLASS FIBER COATINGS FROM ACRYLATE TERMINATED, END-BRANCHED POLYURETHANE POLYUREA OLIGOMERS

John M. Zimmerman, Schaumburg; Gerry K. Noren, Hoffman Estates, and Timothy E. Bishop, Algonquin, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 8, 1985, Ser. No. 752,582

Int. Cl.⁴ C08F *2/50, 126/02, 26/02;* G02B *6/22*

U.S. Cl. 350—96.29 **24 Claims**

1. An ultraviolet curing liquid coating composition which, when cured with ultraviolet light in the presence of a photoinitiator, either provides a single coating for optical glass fiber having adequate strength at room or expected elevated temperature, and a low tensile modulus which remains low to resist microbending difficulties down to around −40° C., or which can be used to overcoat softer buffer coatings which remain soft to resist microbending difficulties down to around −60° C., said coating composition consisting essentially of a linear polyacrylate-terminated polyurethane polyurea oligomer containing a linear polyurethane core terminated at both ends by urea formation with a polyhydroxy-functional amine containing a single isocyanate-reactive amino hydrogen atom, the plurality of hydroxy-terminated branches provided by said amine being capped with an acrylate-functional compound, and said polyacrylate-terminated oligomer being in admixture with an ultraviolet curable liquid acrylate or polyacrylate to provide the liquidity needed for application and to adjust the hardness or softness of the cured coating for the selected single coat or topcoat utility.

6. A coating composition as recited in claim 1 adapted for single coat application in which said ultraviolet curable liquid comprises an acrylate-functional monomer, whose homopolymer has a glass transition temperature less than 0° C.

21. An optical glass fiber single coated with an ultraviolet-cured coating of the composition of claim 6.

4,690,502

ULTRAVIOLET CURABLE OPTICAL GLASS FIBER COATINGS FROM ACRYLATE TERMINATED, END-BRANCHED POLYURETHANE POLYUREA OLIGOMERS

John M. Zimmerman, Schaumburg, and Timothy E. Bishop, Algonquin, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 8, 1985, Ser. No. 752,583

Int. Cl.⁴ C08F *2/50, 26/02, 126/02;* G02B *6/22*

U.S. Cl. 350—96.29 **27 Claims**

1. A ultraviolet curing liquid coating composition which, when cured with ultraviolet light in the presence of a photoinitiator, either provides a single coating for optical glass fiber having adequate strength at room or expected elevated temperature, and a low tensile modulus which remains low to resist microbending difficulties down to around −40° C., or which can be used to overcoat softer buffer coatings which remain soft to resist microbending difficulties down to around −60° C., said coating composition consisting essentially of a linear polyacrylate-terminated polyurethane polyurea oligomer comprising a linear polyurethane terminated with an essentially monohydric adduct of low molecular weight diprimary amine with from about 1 to about 2.5 moles of monoepoxide per mole of diamine and reacted with acrylate-functional monoisocyanate to leave about 1 hydroxy group per molecule, and an ultraviolet curable liquid acrylate or polyacrylate to provide the liquidity needed for application and to adjust the hardness or softness of the cured coating for the selected single coat or topcoat utility.

4. A coating composition as recited in claim 1 adapted for topcoat application in which said ultraviolet curable liquid comprises an acrylate-functional monomer whose homopolymer has a glass transition temperature above about 55° C. in the absence of acrylic acid.

6. A coating composition as recited in claim 1 adapted for single coat application in which said ultraviolet curable liquid comprises an acrylate-functional monomer whose homopolymer has a glass transition temperature less than 0° C.

24. An optical glass fiber single coated with an ultraviolet-cured coating of the composition of claim 6.

4,690,503

GLASS OPTICAL FIBER HAVING A PRIMARY AND A SECONDARY COATING

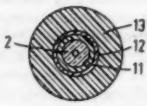
Petrus J. Janssen, and Peter C. Janssens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 12, 1984, Ser. No. 649,634

Claims priority, application Netherlands, Sep. 22, 1983, 8303252

Int. Cl.[4] G02B *6/16, 6/22*

U.S. Cl. 350—96.30 3 Claims



1. A coated optical fiber comprising:

a glass optical fiber;

a primary coating on the fiber, said primary coating comprising a UV cured acrylate; and

a secondary coating surrounding and in intimate contact with the primary coating, said secondary coating comprising a thermoplastic resin;

characterized in that:

the primary coating has a thickness of 50 to 70 microns;

the primary coating consists of an inner primary layer and an outer primary layer of UV cured acrylate, said inner primary layer being in contact with the fiber;

the ratio of the thickness of the inner primary layer to the thickness of the outer primary layer is from 0.5 to 2;

the inner primary layer has a modulus of elasticity less than or equal to 5 Newtons per square millimeter at 25° C.; and

the outer primary layer has a modulus of elasticity from 25 to 1500 Newtons per square millimeter at 25° C.

4,690,504

QUARTZ GLASS-MADE OPTICAL FIBERS AND A METHOD FOR THE PREPARATION THEREOF

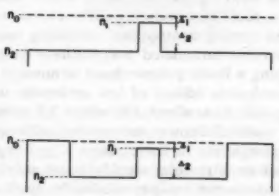
Kiyoshi Yokokawa, and Kazuo Koya, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 31, 1985, Ser. No. 739,874

Claims priority, application Japan, Jun. 4, 1984, 59-114317

Int. Cl.[4] G02B *6/00*

U.S. Cl. 350—96.34 5 Claims



1. An optical fiber of fused quartz glass having a core-and-cladding structure composed of a core portion and a cladding portion on and around the core portion, of which each of the core portion and cladding portion contains fluorine as a dopant to decrease the refractive index of the fused quartz glass, the concentration of the fluorine being higher in the cladding portion than in the core portion, and wherein the core portion has a refractive index lower by 0.01% to 0.1 than that of an undoped fused quartz glass.

4,690,505

LENS MOUNTING

Toshimi Iizuka, Kanagawa, and Shigeru Kamata, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha

Filed May 31, 1985, Ser. No. 740,203

Claims priority, application Japan, Jun. 14, 1984, 59-088803

Int. Cl.[4] G02B *7/02*

U.S. Cl. 350—252 7 Claims

2. A lens mounting comprising:

(a) a body tube;

(b) a holding sleeve holding a lens,

said holding sleeve having a plurality of protruded portions projected to a parallel direction with an optical axis and positioned in a circle with its center at the optical axis;

(c) a movable sleeve arranged in the inner diameter of said body tube,

said movable sleeve having a perpendicular surface perpendicular parallel direction with the optical axis, and a plurabity of camming surfaces being formed in said perpendicular surface; and

(d) a retainer member, said retainer member fixedly securing said holding sleeve to said movable sleeve after said holding sleeve was fitted in the inner diameter of said movable sleeve and the tilt of said lens has been adjusted by the abutting engagement of said camming surfaces on said protruded portions.

4,690,506

METHOD OF PRODUCING VARIED LINE-SPACE DIFFRACTION GRATINGS

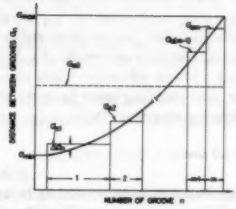
Toshiaki Kita, Nishitama, and Tatsuo Harada, Fuchu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,363

Claims priority, application Japan, Oct. 3, 1984, 59-206278

Int. Cl.[4] G02B *5/18;* B43L *13/24*

U.S. Cl. 350—320 4 Claims



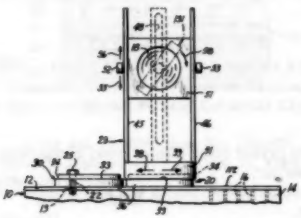
1. In a method of producing diffraction gratings by feeding either one of a blank or a groove-ruling tool by an amount

consisting of the amount of constant transference and the amount of variable transference that is added thereto, or subtracted therefrom, while reciprocally moving the other one of said blank or said groove-ruling tool, in order to rule grooves of irregular intervals on said blank, a method of producing varied line-space diffraction gratings wherein the region of ruling is divided into a plurality of small regions so that the difference between a maximum value and a minimum value of distance between grooves becomes smaller than a predetermined value, and the amount of constant transference is set to be nearly equal to an average distance between grooves in each of said small regions.

4,690,507
MOUNTING SYSTEMS FOR OBJECTS AND OPTICAL COMPONENTS

Micha Zimmermann, Haifa, Israel, assignor to Newport Corporation, Fountain Valley, Calif.

Filed Sep. 9, 1985, Ser. No. 774,029
Int. Cl.[4] G02B 27/02, 7/02
U.S. Cl. 350—321 **33 Claims**



1. In a method of fixing a base for mounting an object on a surface having a two-dimensional pattern of mutually spaced mounting holes for fasteners, the improvement comprising in combination the steps of:

providing said base with two complementary base parts rotatable relative to each other;

providing one of said base parts with an at least partially eccentric aperture for receiving any one of said fasteners at any one of said mounting holes;

placing said base on said surface;

extending one of said fasteners through said aperture at one of said mounting holes;

shifting said base relative to said one of said fasteners at any one of a multitude of positions about said one mounting hole; and

attaching said base to said surface with said one of said fasteners;

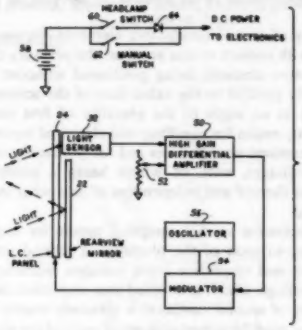
said object being mounted on the other of said base parts, and said base parts being rotated relative to each other as needed for orienting said object above said surface.

4,690,508
LIQUID CRYSTAL CLOSED-LOOP CONTROLLED MIRROR SYSTEMS

Keith D. Jacob, Ann Arbor, Mich., assignor to C-D Marketing, Ltd., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 449,949, Dec. 15, 1982, abandoned. This application May 17, 1985, Ser. No. 735,419
Int. Cl.[4] G02B 17/00; G02F 1/13
U.S. Cl. 350—331 R **39 Claims**

38. A variable brightness rearview mirror system comprising a reflecting surface for reflecting to an observer a field of view and an electrically controlled optical transmission plate disposed in the optical path between the observer and the field of view, said optical transmission plate being operable to any of a number of different states of light transmission between a state of maximum light transmission and a state of maximum opaqueness, and control means for controlling the brightness of the reflected field of view seen by the observer comprising means for closed-loop regulating the state of light transmission of said optical transmission plate to compensate for changes in incident brightness over a range of different intensities of incident brightness detected by a sensor means, said control means comprising a high gain differential amplifier circuit receiving a differential input signal derived from differential

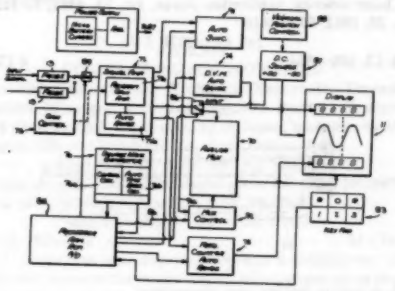


between a signal correlated with the degree of incident brightness of the field of view and a desired reference signal level, said desired reference signal level serving to establish an operating point of nominal incident brightness on the mirror assembly over a range of nominal incident brightnesses about which said sensor means is effective to exercise control of the optical transmission plate over said number of possible states between maximum light transmission and maximum opaqueness.

4,690,509
WAVEFORMS ON A LIQUID CRYSTAL DISPLAY

William Bohmer, Flanders, N.J., assignor to Control Interface Company Limited, Randolph, N.J.

Filed Oct. 2, 1984, Ser. No. 656,972
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—333 **57 Claims**



1. Apparatus for providing a visual display of an electrical input signal, comprising:

a viewing screen of predetermined thickness having two oppositely disposed parallel faces and formed of a material having optical properties which in any predetermined portion of the screen are variable in response to the application of a predetermined electrical potential across the thickness of the screen in the predetermined portion, the variable optical properties enabling the transmission of light to be controlled with respect to the predetermined portion,

a plurality of first conductive elements disposed spaced apart with respect to one another, the plurality of first conductive elements being positioned adjacent and substantially parallel to one face of the screen,

means for applying a voltage gradient across said plurality of first conductive elements to produce a different predetermined voltage on each of the plurality of the first conductive elements and wherein the relationship of each predetermined voltage with respect to another is predetermined,

a plurality of second conductive elements disposed spaced apart with respect to one another, the plurality of second conductive elements being positioned adjacent and substantially parallel to the other face of the screen and extending at an angle to the plurality of first conductive elements, means for sampling said electrical input signal at predetermined sample times and for producing respective input voltages, each of which being a predetermined function thereof and independent of any other input voltage, and

means responsive to said sampling means for sequentially coupling to each of the plurality of second conductive elements said respective input voltages, whereupon each input voltage which is coupled to a respective one of the plurality of second conductive elements coacts with the different predetermined voltage of each of the plurality of first conductive elements across the thickness of the screen to form a plurality of different control voltages impressed across the screen, each of said control voltages enabling the optical properties of the predetermined portion of the screen across which the control voltage is applied to control the transmission of light with respect to the predetermined portion when said control voltage corresponds to a predetermined electrical potential.

4,690,510

STRUCTURE AND METHOD OF CONNECTING TERMINALS OF MATRIX DISPLAY UNITS

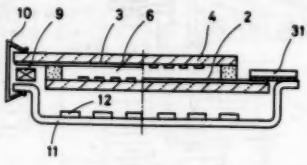
Toshiaki Takamatsu, Tenri; Hiroshi Kuwagaki, Jyoyo; Shigehiro Minezaki, Ikoma; Kunihiko Yamamoto, Nara; Hiroshi Nakatani, Tenri, and Hisao Kawaguchi, Sakai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 512,633, Jul. 11, 1983, abandoned. This application Dec. 2, 1985, Ser. No. 803,522

Claims priority, application Japan, Jul. 13, 1982, 57-122402; Jul. 28, 1982, 57-132810

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—334 **6 Claims**



4. A matrix display unit comprising:

first and second support means in a mutually opposing planar relationship for forming a liquid crystal display panel;

first electrode means disposed on either of said first or second support means;

driver means for driving said liquid crystal display panel;

driver support means for supporting said driver means;

second electrode means mounted on said driver support means, said second electrode means being in a mutually perpendicular relationship to said first electrode means; and

connector means for connecting said first and second electrode means, said connector means bridging together either end of said first and second support means without the necessity for a through-hole;

said first and second electrode means being aligned such that said connector means bridges together either end of said first and second support means without having to be folded over itself.

4,690,511

LIQUID CRYSTAL COLOR DISPLAY PANEL WITH MOSAIC COLOR FILTER

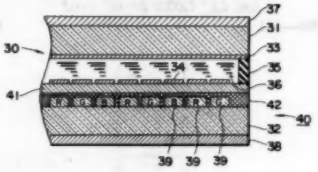
Haruo Watanabe, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 592,587, Mar. 23, 1984, abandoned. This application Apr. 18, 1986, Ser. No. 854,684

Claims priority, application Japan, Mar. 31, 1983, 58-55623

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—339 F **2 Claims**



1. A liquid crystal color display panel comprising:

a first polarizer;

a first transparent plate having said first polarizer on its outer surface;

a color filter having a mosaic array of red, green and blue filter elements provided on an inner surface of said first transparent plate;

a glass plate bonded on said color filter by a bonding agent, said glass plate being less than 200 μm in thickness and thin as compared with said first plate;

a plurality of transparent electrodes provided on an inner surface of said glass plate each in exact registration with each of the filter elements of said color filter;

a twisted nematic liquid crytal surrounded by a gasket and accommodated on the inner surfaces of said plurality of transparent electrodes and said glass plate, said twisted nematic liquid crystal exhibiting a property of rotating the polarization plane of transmitted light in response to one of the presence and the absence of an electric field across said liquid crystal layer;

at least one common electrode layer provided in contact with an inner surface of said liquid crystal layer;

a second transparent plate having said common electrode layer on its inner surface, said inner surface opposing said inner surface of said glass plate; and

a second polarizer provided on an outer surface of said transparent plate.

4,690,512

COMPOSITE LENS ASSEMBLY

Robert P. Forsyth, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 28, 1985, Ser. No. 695,238

Int. Cl.[4] B29D *11/00*; G02B *3/00*; B32B *7/00*

U.S. Cl. 350—417 **23 Claims**

1. A lens assembly comprising:

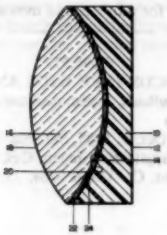
a first lens element having an optical surface of a predetermined configuration;

a second lens element formed of an organic polymer and having an optical surface facing the optical surface of the first lens element and being of a configuration substantially complementary thereto;

a substantially uniform layer of room temperature vulcaniz-

able silicone adhesive in contact with the optical surface of the first lens element; and

a primer coating comprising an aliphatic polyurethane on



the optical surface of the second lens element and in contact with the layer of adhesive for providing a physically stable, optically neutral bond between the first and second lens elements.

4,690,513

WIDE ANGLE HIGH RANGE ZOOM LENS

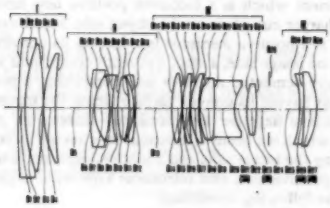
Sadatoshi Takahashi, Tokyo, and Tsunefumi Tanaka, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 759,907

Claims priority, application Japan, Jul. 31, 1984, 59-161049; Dec. 13, 1984, 59-263636

Int. Cl.[4] G02B *7/10, 9/64, 15/14*

U.S. Cl. 350—427 **10 Claims**



1. A zoom lens system comprising, from front to rear, a first lens unit of positive refractive power, a second lens unit of negative refractive power, a third lens unit of positive refractive power and a fourth lens unit, wherein when zooming from a wide angle end to a telephoto end, said first lens unit and said third lens unit are axially movable forward in unison, and said second lens unit is axially movable non-linearly relative to the movement of said first lens unit and said third lens unit, said zoom lens system satisfying the following conditions:

$$0.4\ fT < f1 < 0.65\ fT$$

$$0.4\ fW < |f2| < 0.25\ fT$$

$$0.12\ fT < f3 < 0.35\ fT$$

$$-0.18 < fW/f4$$

$$fT/f4 < 0.1$$

$$0.8 < |\beta 2T| < 1.0$$

where fi is the focal length of the i-th lens unit counting from the front, fW and fT are the shortest and longest focal lengths of the entire zoom lens system, respectively, and β 2T is the lateral magnification of said second lens unit when said zoom lens system is at the telephoto end.

4,690,514

LENS MOVING DEVICE

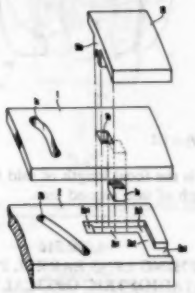
Shigeru Kamata, Tokyo, and Toshimi Iizuka, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,110

Claims priority, application Japan, Oct. 23, 1984, 59-221194

Int. Cl.[4] G02B *7/10*

U.S. Cl. 350—429 **6 Claims**



1. A lens moving device comprising:

(a) an optical lens contributing to a zooming function and a lens holder holding said lens;

(b) a body tube, said body tube being provided with a penetration hole and a first engaging portion on an inner surface thereof;

(c) operating means;

(d) a movable sleeve fitted in said body tube and arranged, upon actuation of said operating means, to move, said movable sleeve having a guide groove or slot engaging with said first engaging portion of said body tube; and

(e) an engagement member, said engagement member being positioned outside of said body tube and having a second engaging portion fitted in both said penetration hole of said body tube and said guide groove or slot of said movable sleeve.

4,690,515

COMPACT PROJECTION LENS

Yasuo Nakajima, Ibaraki; Yoshiharu Yamamoto, Toyonaka; Yoshito Miyatake; Yoshitomi Nagaoka, both of Neyagawa, and Shusuke Ono, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 25, 1985, Ser. No. 802,341

Claims priority, application Japan, Dec. 20, 1984, 59-269783; Feb. 6, 1985, 60-21251; Mar. 30, 1985, 60-65044

Int. Cl.[4] G02B *9/12, 9/34, 13/18*

U.S. Cl. 350—432 **16 Claims**

1. A projection lens disposed between a cathode ray tube (CRT) and a screen for projecting an enlargement of an image on the cathode ray tube (CRT) onto the screen, said projection lens comprising:

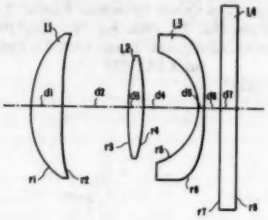
first, second and third lenses disposed successively in a direction extending from the screen to the CRT,

said first lens having a positive optical power and two optical surfaces spaced from one another in said direction and through which said image passes to the screen, at least one of said two surfaces being aspherical, and the one of said two surfaces that faces the screen being convex,

said second lens having a positive optical power, and bi-convex surfaces spaced from one another in said direction and through which said image passes before passing through said first lens,

said third lens having a negative optical power and an aspheric concave surface facing said second lens through which said image passes before passing through said second lens, and

the projection lens satisfying the following condition



$$0.55 < f_1/f_2 < 1.2$$

in which f_1 is the focal length of said first lens and f_2 is the focal length of said second lens.

4,690,516

PHOTOGRAPHING LENS BARREL PROVIDED WITH A CATADIOPTRIC OPTICAL SYSTEM

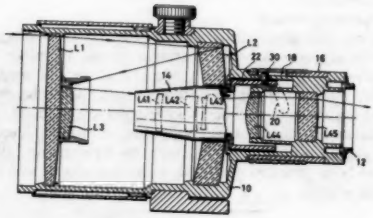
Hideo Kanno, Chiba, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 658,990

Claims priority, application Japan, Oct. 20, 1983, 58-195224

Int. Cl.[4] G02B *17/08, 7/04*

U.S. Cl. 350—444 **11 Claims**



1. Optical apparatus comprising:

optical means including a first dioptric system, a first catoptric system having an opening formed at a middle portion thereof including an optical axis and an annular reflective surface disposed to reflect a beam of light coming from an object and transmitted through said first dioptric system, a second catoptric system located on the optical axis in the vicinity of said first dioptric system and disposed to reflect the beam from said first catoptric system toward said opening, and a second dioptric system having a moving lens group to be moved in the direction of the optical axis in an area near said opening and disposed to transmit the beam from said second catoptric system;

a stationary cylindrical member holding said first dioptric system and said first catoptric system;

a movable cylindrical member provided in said stationary cylindrical member and holding said moving lens group, said movable cylindrical member having a diameter smaller than a diameter of said opening of said first catoptric system and being movable in the direction of the optical axis passing through said opening of said first catoptric system;

a moving member provided to be moved in the direction of the optical axis;

transmission means for moving said movable cylindrical member in response to said moving member, said transmission means including movement expanding means for moving said movable cylindrical member over an expanded distance relative to the moved distance of said moving member; and

operating means for moving said moving member.

4,690,517

RETROFOCUS TYPE WIDE ANGLE LENS

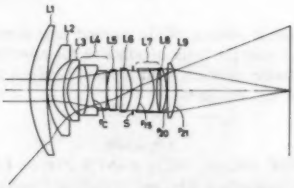
Daijiro Fujie, Sagamihara, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,523

Claims priority, application Japan, Oct. 9, 1984, 59-212243

Int. Cl.[4] G02B *9/64, 13/04*

U.S. Cl. 350—458 **13 Claims**



1. A retrofocus type wide angle lens having, in succession from the object side, a first component which is a positive meniscus lens having its convex surface facing the object side, a second component which is a negative meniscus lens having its convex surface facing the object side, a third component which is a negative meniscus lens having its convex surface facing the object side, a fourth component having a cemented surface of negative refractive power convex toward the object surface and having a negative refractive power as a whole, a fifth component which is a biconvex positive lens having a surface of sharper curvature on the object side, a sixth component which is a positive meniscus lens having its convex surface facing the image side, a stop, a seventh component which is a biconcave cemented negative lens comprising a positive meniscus lens having its convex surface facing the image side and a biconcave negative lens cemented thereto, an eighth component which is a positive meniscus lens having its convex surface facing the image side, and a ninth component which is a biconvex positive lens, said retrofocus type wide angle lens satisfying the following conditions:

$$-0.9f < f_{14} < -0.6f$$

$$0.35f < D_4 < 0.53f$$

$$-1.3f < r15 < -0.9f$$

$$-0.9 < (r_{21}+r_{20})/(r_{21}-r_{20}) < -0.2$$

$$23 < \nu_2 < 40$$

where f is the combined focal length of the entire system, f_{14} is the combined focal length of said first to fourth components, D_4 is the combined center thickness of said fourth component, r15 is the radius of curvature of the object side lens surface of said seventh component, r20 and r21 are the radii of curvature of the object side and image side lens surfaces, respectively, of said ninth component, and ν_2 is the Abbe number of said second component.

4,690,518

WIDE ANGLE COPYING LENS SYSTEM

Taira Kouchiwa, Kamakura, and Kiichiro Nishina, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 839,044

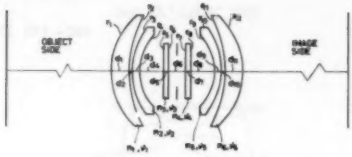
Claims priority, application Japan, Mar. 15, 1985, 60-50616

Int. Cl.[4] G02B *9/62*

U.S. Cl. 350—464 **5 Claims**

1. A wide angle copying lens system comprising a completely symmetrical arrangement of six units in the form of six lenses which consists of, in order from the object field side, a

first lens in the form of a positive meniscus with the convex surface directed toward the object field, a second lens in the form of a negative meniscus with the convex surface directed toward the object field, a third lens in the form of a positive meniscus with the concave surface directed toward the object field, a diaphragm, a fourth lens in the form of a positive meniscus with the concave surface directed toward the image field



in and of the same configuration as that of the third lens with the diaphragm placed therebetween, a fifth lens in the form of a negative meniscus with the convex surface directed toward the image field and of the same configuration as that of the second lens, and, a sixth lens in the form of a positive meniscus with the convex surface directed toward the image field and of the same configuration as that of the first lens,

the lens system satisfying the following conditions:

$$2.4 < f_{1,2}/f_1 < 2.8$$

$$0.065 < \frac{d_1 + d_2 + d_3}{f} < 0.075$$

$$11 < f_3/f < 17$$
$$1.62 < n_1 < 1.7$$
$$55 < \nu_1 < 63$$
$$1.7 < n_2 < 1.75$$
$$\nu_2 < 30$$

where

f: combined focal length of the entire system

f_i: focal length of the i^{th} lens

$f_{1,2}$: combined focal length of a first and second lenses

d_i: axial spacing between the i^{th} surface and the $(i=1)^{th}$ surface

n_i: refractive index of the i^{th} lens

ν_i: Abbe's number of the i^{th} lens.

4,690,519

ZOOM MICROSCOPE HAVING A CRANK AND LINKAGE MECHANISM

James A. Clark, Honeoye Falls, and Henry J. Emmel, Rochester, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 17, 1985, Ser. No. 735,412
Int. Cl.[4] G02B 7/10, 21/22
U.S. Cl. 350—515 **19 Claims**

1. A variable power optical instrument comprising:

(a) support means;

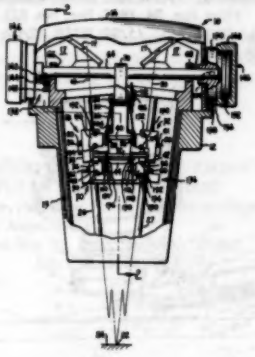
(b) first and second support rods secured to said support means;

(c) first and second lens carriers for supporting a pair of lenses and positioning said lenses along the optical axis of said instrument, each of said carriers including means for guiding said carriers along said first support rod and an arm secured to and extending therefrom for engaging said second rod;

(d) means for biasing each of said carriers into engagement with both said first and said second support rods to prevent rotation of said carriers relative to said first rod;

(e) means secured to said support means, for moving said first and second lens carriers along said optical axis ;and

(f) support means, slidably secured to said second rod, for supporting said biasing means, said biasing means being secured between said support means for supporting said biasing means and each of said carriers to bias each of said



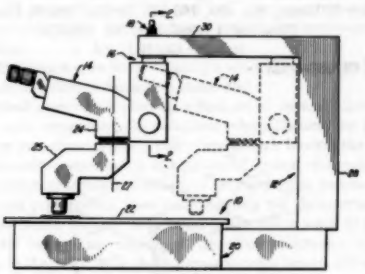
carriers into said first rod and said arms into engagement with said second rod.

4,690,520

APPARATUS FOR USE IN TRANSPORTING A PHOTOGRAMMETRIC MICROSCOPE FROM A FIRST POSITION TO A SECOND POSITION

Alfred L. Shawcross, Lima; Donn E. Stevens, and Robert E. Jones, both of Rochester, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 5, 1986, Ser. No. 859,511
Int. Cl.[4] G02B 21/22; F16M 11/04
U.S. Cl. 350—517 **12 Claims**



1. Apparatus for permitting movement of a microscope suspended by a horizontal support arm of an optical instrument from a first fixed position over an object to be viewed to a second position, comprising:

guide means affixed to the horizontal support arm and extending substantially horizontally above the object;

slide means having a microscope mounted thereto, said slide means being slidably mounted to said guide means; and

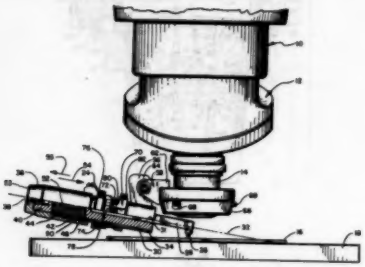
clamping means affixed to the horizontal support arm for locking said slide means to the horizontal support arm in a preselected first position along said guide means and for unlocking said slide means from the horizontal support arm to enable said slide means to be moved along said guide means to a second position, said clamping means including a first member for pivotal engagement with a surface formed on the horizontal support arm and a second member pivotally connected thereto, said second member being releasably received within a longitudinal slot formed within said guide means.

4,690,521

MICROSCOPE SLIDE MARKING DEVICE AND METHOD

Geno Saccomanno, 778 26½ Rd., Grand Junction, Colo. 81501

Filed Jan. 24, 1986, Ser. No. 821,953
Int. Cl.[4] G02B *7/02, 15/02;* B23B *49/02;* G01B *5/14*
U.S. Cl. 350—520 31 Claims



26. A device for making reference marks on a microscope slide comprising:

means for mounting said device to a microscope having an optical centerline or axis;

a marking nib adapted to selectively place a reference mark on said slide;

a plunger means for activating said nib and selectively reference marking said slide;

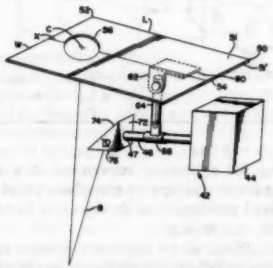
positioning means apart from said mounting means adapted to allow said selective placement of the reference mark at a selectively variable position relative to said optical centerline during normal use.

4,690,522

MICROSCOPE ILLUMINATOR SUPPORT

Robert C. Welsh, Ste. 608, 168 SE. 1st St., Miami, Fla. 33131

Filed Jul. 1, 1985, Ser. No. 750,279
Int. Cl.[4] G02B *21/08*
U.S. Cl. 350—528 10 Claims



1. An illuminator support for use with a microscope holder having an opening therethrough of a dimension sufficient to receive a lens for a microscope, a line of vision being defined by said lens and a subject to be viewed with said microscope, said illuminator support comprising:

a plate having a first portion and a second portion, said first portion being clamped between said microscope and said microscope holder and having an aperture therethrough of dimensions corresponding to the dimensions of said opening, said lens being inserted through said aperture;

said second portion extending from said first portion; and

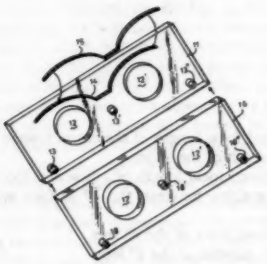
bracket means secured to said second portion of said plate for supporting an illuminator means for projecting a beam of light, said bracket means including an arm, said arm having one end pivotably attached to said plate and an opposite end with a clamp for supporting said illuminator means, said illuminator means having an outlet end for projecting a beam of light therethrough, said bracket means locating said outlet end of said illuminator means such that an angle between said beam of light and said line of vision is in the range of 5°–8°.

4,690,523

MONOLITHIC REINFORCED EYEGLASS FRAME AND FRICTION WELDING METHOD FOR MANUFACTURING SAME

Joseph Loiacono, Ft. Salonga, N.Y., assignor to Kenco Optics, Inc., Boca Raton, Fla.

Filed Jul. 3, 1985, Ser. No. 752,213
Int. Cl.[4] G02C *5/02*
U.S. Cl. 351—129 18 Claims



1. A method for manufacturing a monolithic eyeglass frame member fabricated from thermoplastic resin and having a reinforcement member fully embedded therein which comprises:

(a) superimposing a first thermoplastic resin sheet upon a second thermoplastic sheet with a reinforcement element disposed therebetween, the adjacent surfaces of said sheets being in substantial contact with each other;

(b) applying a pressure force to the outer surfaces of said first and second thermoplastic sheets in a direction which is transverse to the lengths thereof to force said sheets toward one another with said reinforcements element disposed therebetween;

(c) applying a motion to one of said thermoplastic sheets relative to the other while said sheets are under pressure thereby creating frictional heat sufficient to melt the thermoplastic resin at the interface of the two sheets such that upon cooling of the sheets to below the melt temperature of the molten thermoplastic resin, there is provided a monolithic, one piece frame front member ready for rough-machining;

(d) rough-machining the one piece frame front member to provide semi-finished frame front member; and,

(e) finishing the semi-finished frame front member to provide a finished monolithic eyeglass frame front member.

4,690,524

MULTIFOCAL SPECTACLE LENS HAVING A LARGE NEAR-VISION PART

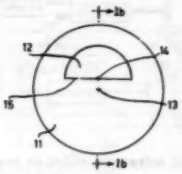
Erwin J. Daniels, Aalen, and Siegfried Korn, Oberkochen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Feb. 11, 1985, Ser. No. 700,392

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 8404836[U]

Int. Cl.[4] G02C 7/06

U.S. Cl. 351—168 11 Claims



1. A multifocal spectacle lens having a large near-vision part, the spectacle lens comprising:

a base lens dimensioned for the near-vision range, said base lens having an outer surface facing objects to be viewed and having a recess formed in said outer surface;

a supplementary lens seated in said recess so as to be in juxtaposition with said base lens to form a composite lens defining a predetermined region of said spectacle lens for a distance-vision range thereof; and,

said base lens having an index of refraction greater than the index of refraction of said supplementary lens thereby causing said composite lens to have a refractive power less than the remainder of said base lens outside of said predetermined region.

4,690,525

EYE FUNDUS CAMERA

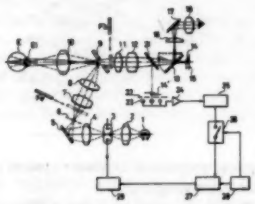
Kazunobu Kobayashi, Yokohama; Kyoji Sekiguchi, Tokyo; Isao Matsumura, Yokosuka, and Haruhisa Madate, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1984, Ser. No. 682,231

Claims priority, application Japan, Dec. 27, 1983, 58-245965

Int. Cl.[4] A61B 3/14; G03B 7/00

U.S. Cl. 351—206 6 Claims



1. An eye fundus camera having:

an illuminating system for illuminating an eye to be examined;

a photographing system for photographing the fundus of the eye to be examined;

light receiving portions comprising multiple spots for receiving the reflected light from the eye fundus illuminated by said illuminating system, said light receiving portions being disposed in a plane substantially optically conjugate with the fundus of the eye to be examined, the spacing between each two adjacent spots being greater than a length corresponding to a diameter of the optic disk of the eye fundus; and

a control unit for processing the outputs of said light receiving portions to restrict influence of the optic disk, and automatically controlling the quantity of photographing light.

4,690,526

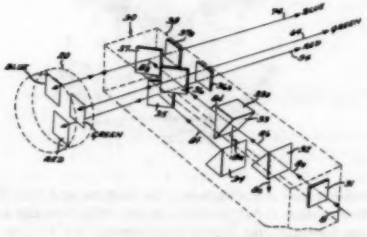
PRISM ASSEMBLY FOR A SINGLE LIGHT VALVE FULL-COLOR PROJECTOR

Arno G. Ledebuhr, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 12, 1985, Ser. No. 775,890

Int. Cl.[4] G02F 1/13

U.S. Cl. 353—31 7 Claims



1. In a color, single light valve projector system wherein three input images corresponding to three primary color components of a color image to be projected are applied to three separate regions of a photoresponsive layer of the single light valve, each region having "on" and "off" states corresponding to image information in the primary color, the improvement comprising:

prepolarizing means for polarizing a white illumination light beam to a first polarization state; and

an optical assembly including a first set of optical elements for color separating the polarized white illumination light beam into three primary color beams each having the first polarization state and a second set of optical elements for polarization of each of the three primary color beams to a second polarization state and directing the three primary color beams having the second polarization state to individual ones of the regions of the photoresponsive layer, where the respective three primary color beams are each reflected from the "on" state portion of the regions of the photoresponsive layer as image bearing color components having the first polarization state corresponding to the input image information, the image bearing component being passed through said second set of optical elements as three primary color beams.

4,690,527

DEVICE FOR REPRODUCTION AND TRACING

Masakazu Ohtorii, Hikoneshi, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jun. 18, 1985, Ser. No. 745,918

Claims priority, application Japan, Nov. 13, 1984, 59-171969

Int. Cl.[4] G03B 21/06

U.S. Cl. 353—65 8 Claims

1. In a device for reproduction and tracing of an original comprising

(a) a table upon which the original is placed;

(b) a screen apart from said table;

(c) at least one lens disposed between said table and said

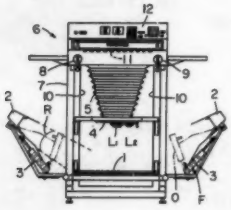
screen such that an image of an original placed upon the table can be formed on the screen at a desired scale;

(d) a frame supporting said table, screen and lens;

(e) at least one arm affixed to said frame at one end, and being free at the other end;

(f) at least one illumination system for reproduction supported by said arm and positioned so as to illuminate the original placed upon the table; and

(g) at least one illumination system for tracing supported by said arm and disposed between said illumination system for reproduction and said table, said illumination system for tracing being movable between an extended position wherein the illumination system for tracing extends into a space between the original placed on the table and said illumination system for reproduction, and a retracted position wherein the illumination system for tracing is



outside said space between the original and said illumination system for reproduction, the improvement comprising forming said illumination system for tracing from a lamp means having a luminous front surface and an absorptive back surface, a supporting member, and a positioning means, wherein a first end of said supporting member is pivotally connected to the free end of said arm, and wherein said lamp means is pivotally connected to a second end of said supporting member such that in the retracted position said lamp means is rotatable such that the front surface faces the arm whereby illumination from the illumination system for reproduction can strike only the back surface, and such that in the extended position the front surface is oriented so as to illuminate the original on the table and is fixed in that orientation by the positioning means.

4,690,528

PROJECTION EXPOSURE APPARATUS

Akikazu Tanimoto, Yokohama, and Kazunori Imamura, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,746

Claims priority, application Japan, Oct. 5, 1983, 58-186266; Oct. 7, 1983, 58-187866; Oct. 7, 1983, 58-187867

Int. Cl.[4] G03B *3/10*

U.S. Cl. 353—101 **17 Claims**

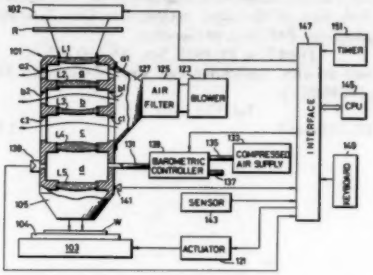
1. Apparatus for projecting a pattern on a first plane onto a second plane, comprising:

a projection lens system disposed between said first and second planes and including a plurality of lens elements arranged in a spaced relation and defining a plurality of spaces;

means for isolating at least one of said spaces from the atmosphere;

means for supplying a gas flow to at least another one of said spaces different from said isolated space for cooling the lens elements facing said another one space, said supply means having inlet means and outlet means at opposite sides of an optical path of said projection lens system, respectively, and passing said gas flow across said optical path from said inlet means to said outlet means; and

means for changing the refractive index of said isolated space, said changing means including means for measuring the temperature of said projection lens system, means for measuring the pressure of the atmosphere and means for



controlling said refractive index in response to the measured temperature of said projection lens system and the measured pressure of the atmosphere.

4,690,529

OPTICAL EXPOSER

Shuji Sugiyama; Shuji Syohda, both of Katsuta, and Shinji Kuniyoshi, Suginami, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

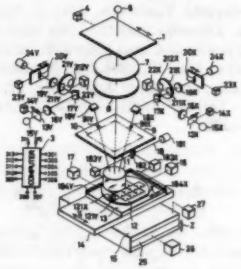
PCT No. PCT/JP84/00467, § 371 Date Aug. 5, 1985, § 102(e) Date Aug. 5, 1985, PCT Pub. No. WO85/01834, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 3, 1984, Ser. No. 741,800

Claims priority, application Japan, Oct. 7, 1983, 58-187025

Int. Cl.[4] G03B *27/52*

U.S. Cl. 353—122 **16 Claims**



1. An optical projection exposure system comprising:

means for generating light;

a mask having a predetermined pattern and at least one alignment mark;

means for directing said light to said mask;

a projection lens for projecting an image of said predetermined pattern onto a work piece, said work piece including at least one alignment mark; and

means for detecting a first superposed image of a first light wavelength composed of a first focused image of said at least one alignment mark of said work piece through said projection lens and said at least one alignment mark of said mask, and for detecting a second superposed image of a second wavelength composed of a second focused image of said at least one alignment mark of said work piece through said projection lens and said at least one alignment mark of said mask.

4,690,530

CAMERA WITH RELEASE CONTROL AND AUTOMATIC FILM SENSITIVITY SETTING

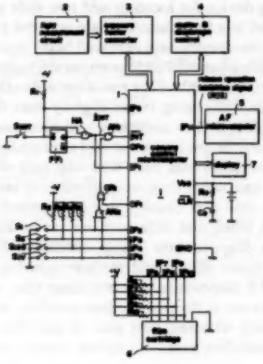
Akihiko Fujino, Sakai; Masabu Inoue, Kobe; Masaaki Nakai, Kawachinagano, and Minoru Sekida, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 26, 1985, Ser. No. 801,912

Claims priority, application Japan, Nov. 26, 1984, 59-178792[U]; Dec. 10, 1984, 59-187985[U]; Dec. 10, 1985, 59-187986[U]

Int. Cl.[4] G03B *1/60, 7/24, 17/38*

U.S. Cl. 354—21 11 Claims



1. A camera which is adapted to be transferred to a normal photographing condition through winding-up of a film contained in a film cartridge by a predetermined length, said camera comprising:

switch means changed over from a first state to a second state upon transfer of said camera to said normal photographing condition;

determining means for determining whether or not said camera is in said normal photographing condition in response to said winding-up;

signal generating means for generating a release inhibition signal under a condition of said camera in which it is undesirable to start an exposure operation; and

release control means for inhibiting said camera from being released to start an exposure operation in response to said release inhibition signal when said determining means indicates that said camera is in the normal photographing condition while allowing said camera to be released independently of the generation of said release inhibition signal when said determining means indicates that said camera is not in said normal photographing condition.

4,690,531

LOW COST TELEPHOTO AND NORMAL LENS CAMERA WITH AN EXTENDABLE FLASH

David E. Hansen, Fairport; Richard R. Kelbe, Fishers, and Dana W. Wolcott, Honeoye, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1985, Ser. No. 748,535

Int. Cl.[4] G03B *15/03, 13/02*

U.S. Cl. 354—149.11 3 Claims

1. In a camera including means for providing a source of flash illumination having means adjustable for varying the illumination projected toward a photographic subject, a viewfinder adjustable to provide relatively wide-angle and relatively narrow-angle views of a scene, and lens apparatus movable for focusing said camera according to the distance between said camera and a subject to be photographed, the improvment comprising:

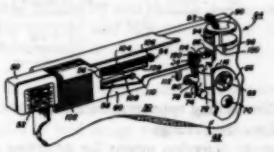
control means for controlling jointly said lens apparatus, said flash source, and said viewfinder, said control means having:

(1) a first condition in which

(i) said lens apparatus is focused at a relatively short distance,

(ii) said flash source is positioned at a first distance from the lens apparatus, and

(iii) said viewfinder is adjusted to provide a relatively wide-angle view of a photographic scene including a photographic subject situated at such relatively short distance,



(2) a second condition in which

(i) said lens apparatus is focused at a relatively remote distance,

(ii) said flash source is positioned at a second distance from the lens apparatus greater than said first distance, and

(iii) said viewfinder is adjusted to provide a relatively narrow-angle view of a photographic scene including a subject situated at the remote distance, and

(3) a third condition in which said lens apparatus, said viewfinder and said flash source are covered.

4,690,532

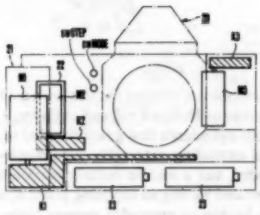
MOTORIZED DRIVE DEVICE FOR CAMERA

Masaharu Kawamura, Kawasaki; Yoshihito Harada, Yokohama; Ryuichi Kobayashi, Kawasaki; Masayuki Suzuki, Yokohama; Tsunemasa Ohara, and Yoichi Tosaka, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1986, Ser. No. 911,992

Int. Cl.[4] G03B *1/18, 17/18, 17/42*

U.S. Cl. 354—173.11 27 Claims



1. A motorized drive device for a camera comprising:

(a) a motor as a rotation drive source;

(b) a transmission system to be driven by said motor, said transmission system having at least two speed reduction ratios set therein;

(c) a camera mechanism to be driven by the output of said transmission system;

(d) control means for changing over said transmission system between the two speed reduction ratios; and

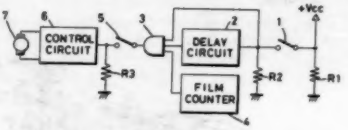
(e) display means for changing the display state in response to changeover of the speed reduction ratio of said transmission system by said control means.

4,690,533

FILM FEEDING APPARATUS FOR CAMERA

Hiroshi Wakabayashi, Yokohama, and Kazuyuki Kazami, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 797,970
Claims priority, application Japan, Dec. 4, 1984, 59-256281
Int. Cl.[4] G03B *1/18*
U.S. Cl. 354—173.11 **12 Claims**



1. A film feeding apparatus for a camera to feed a film from a cartridge, comprising:

rear cover detection moans for detecting closing of a rear cover of a camera so as to generate a close signal;

a delay circuit which starts counting upon reception of the close signal and generates a delay signal after a predetermined time elapses from reception of the close signal; and

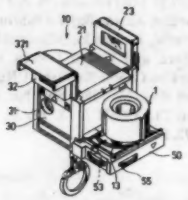
feed means, including a motor, for energizing the motor upon reception of the delay signal so as to successively feed a film from the cartridge.

4,690,534

SUPERMINIATURE CAMERA

Cheng Chen-Liang, Hsintien, Taiwan, assignor to Chen Liang Co., Ltd., Hsintien, Taiwan

Filed Oct. 1, 1986, Ser. No. 914,017
Int. Cl.[4] G03B *1/10, 13/06, 17/04*
U.S. Cl. 354—187 **4 Claims**



1. A superminiature camera for use with a 110 film cassette, said film cassette including a roll-out cylinder, a spool mounted in said roll-out cylinder, a first gear provided on an end portion of said spool extending externally of said roll-out cylinder, a roll-in cylinder, and a middle hollow section connecting said two cylinders and having an exposing portion, said superminiature camera having an extensible camera body, said extensible camera body comprising:

a front wall with a lens thereon;

a first side wall;

a rotary second side wall, opposing said first side wall, pivoted to said lower wall at a lower side of said rotary side wall and rotatable to a horizontal position when it is to used, a second gear on an inner surface of said rotary second side wall capable of engaging with said first gear of said film cassette, and a rotary knob integrated with said second gear;

a releasable fastening device for fastening said rotary second side wall to said upper wall when said superminiature camera is in an idle condition;

a rear wall, including an upper slide portion and a lower slide portin thereon, said slide portions projecting from said rear wall toward said front wall;

an upper wall including a first guide device thereon for guiding the sliding movement of said upper slide portion of said rear wall with respect ot said upper wall so as to permit the horizontal movement of said rear wall;

a lower wall including a second guide device thereon for guiding the sliding movement of said lower slide portion of said rear wall with respect to said lower wall so as to permit the horizontal movement of said rea wall;

a viewfinder, including an eyepiece mounted on a front side of said camera body, and an objective piece opposing said eyepiece on a rear side of said camera body; and

a locating device for locating said two slide portions of said rear wall at a front, intermediate and rear positions of said two guide devices, said rear wall being nearest to said two side walls when said slide portions are located at said front position, the width of the space between said rear wall and said side walls being larger slightly than the thickness of said middle hollow section of said film cassette when said slide portions are located at said intermediate position, the space between said rear wall and said side walls being higher and wider than said cylinders of said film cassette;

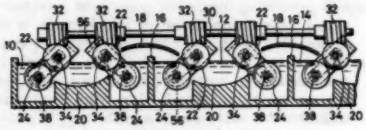
whereby, said film cassette can be inserted into the space formed when said slide portions are in the rear position, can be snapped into usable condition when said slide portions are in the intermediate position, wherein said second is disposed in such a manner that, when said slide portions are in the intermediate position, said second gear will mesh with said first gear of said film spool so as to drive said first gear.

4,690,535

AUTOMATIC FILM PROCESSOR ARRANGEMENT

Takao Kubota, and Yasuo Ujii, both of Saitama, Japan, assignors to Sun Seiki Co., Ltd., Japan

Filed Jun. 27, 1986, Ser. No. 881,977
Claims priority, application Japan, Jul. 3, 1985, 60-101533
Int. Cl.[4] G03B *3/08*
U.S. Cl. 354—322 **4 Claims**



1. An automatic film processor arrangement including a plurality of processing tanks, each being charged with a processing liquid and plural pairs of rollers received therein to continuously pass a photosensitive film through the processing liquid, wherein:

each of said rollers includes a shaft projecting from its both ends, which is provided with a lock groove in the circumferential direction,

a sleeve-like bearing is provided to rotatably support said shaft, said bearing being formed on the inner face with a projection to be locked in said lock groove, including a split groove which extends axially from the mouth thereof which is open on the roller side, and being formed on the outer face with flat portions, and

a lock plate is provided to supprt said bearing, said lock plate including an elogated slot having a width equal to the distance between said flat portions of said bearing, and serving to receive the flat portions of said bearings for a pair of rollers, thereby supporting said pair of rollers while they come into contact with each other along the full length thereof.

4,690,536

EXPOSURE CONTROL DEVICE FOR A CAMERA IN FLASH PHOTOGRAPHY

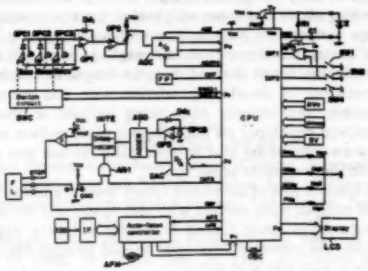
Masaaki Nakai, Kawachinagano; Shuji Izumi; Akihiko Fujino, both of Sakai; Nobuyuki Taniguchi, Nishinomiya; Toshio Yamaki, Osaka, and Hiromu Mukai, Kawachinagano, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1986, Ser. No. 905,160

Claims priority, application Japan, Sep. 9, 1985, 60-200277; Sep. 9, 1985, 60-200278; Sep. 9, 1985, 60-200279; Sep. 9, 1985, 60-200280; Sep. 10, 1985, 60-201126

Int. Cl.[4] G03B *7/097, 15/05*

U.S. Cl. 354—402 6 Claims



1. An exposure control device for a camera in flash photography comprising;

first means for measuring light from a central area of an object field;

second means for measuring light from another area surrounding the central area;

means responsive to said first and second measuring means for detecting a rear light condition;

means for controlling exposure in response to said second measuring means to cause an over-exposure by a given value when said detecting means detects the back light condition;

means for directing a flash light emission; and

means for integrating light reflected from the object field upon the flash light emission to stop the flash light emission when the integrated light reaches a predetermined level.

4,690,537

LENS BARREL

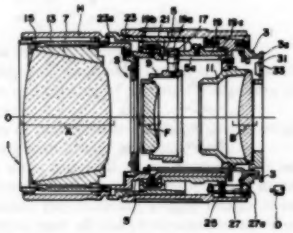
Makoto Ando, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed Sep. 23, 1985, Ser. No. 779,185

Claims priority, application Japan, Sep. 25, 1984, 59-199858

Int. Cl.[4] G03B *3/10*

U.S. Cl. 354—402 7 Claims



1. A lens barrel detachably attached to a camera including focus detaching means detecting an amount of an aberration of positions between a predetermined focal plane and an image surface, signal means generating a focus detecting signal corresponding to said aberration amount and driving means moving in response to said signal, said lens barrel comprising:

storage means for storing a fixed coefficient for tranforming said aberration amount to a focus detecting signal corresponding to said amount;

information means for generating said fixed coefficent to said signal means of said camera;

an optical lens system including a stationary front element and a movable element movably supported along its optical axis for focusing;

a rotating member rotated by said driving means; and

a cam means for moving said movable element along its optical axis in response to the rotation of said rotating member,

wherein said cam means is formed such that the degree of rotation ($\Delta\theta$) of said rotating member and the amount of movement (ΔL) of said image surface have a following relation:

$$\Delta\theta = C \cdot \Delta L$$

(wherein C is a constant).

4,690,538

FOCUS DETECTION SYSTEM AND LIGHTING DEVICE THEREFOR

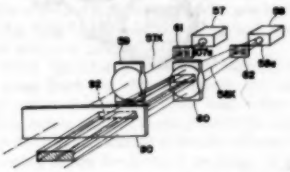
Tohru Matsui, Sakai, and Takeshi Egawa, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 807,642, Dec. 11, 1985, abandoned. This application Dec. 9, 1986, Ser. No. 940,190

Claims priority, application Japan, Dec. 11, 1984, 59-261194; Jan. 17, 1985, 60-7178; Jan. 19, 1985, 60-7686; Jan. 21, 1985, 60-9716

Int. Cl.[4] G03B *3/00, 15/03;* G01J *1/20*

U.S. Cl. 354—403 62 Claims



1. A focus detection system for detecting focus condition of an objective lens of a camera with respect to an object within a focus detection area which spreads at a solid angle centering at the optical axis of said objective lens, comprising:

a first light projecting optical system for projecting a first flux of light which illuminates a first distance zone within said focus detection area; and

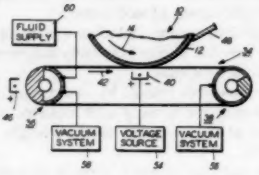
a second light projecting optical system for projecting a second flux of light which illuminates a second distance zone within said focus detection area, said second distance zone being set wider than said first distance zone so as to cover the whole of said first distance zone at a farther distance side thereof and so as to extend beyond said first distance zone at a closer distance side thereof.

4,690,539

TRANSFER APPARATUS

Charles A. Radulski, Macedon, and Henry R. Till, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 27, 1986, Ser. No. 867,129
Int. Cl.[4] G03G *15/01, 15/14*
U.S. Cl. 355—3 TR **26 Claims**



1. An apparatus for transferring a plurality of liquid images having at least a liquid carrier with toner particles dispersed therein from a member to a copy sheet, including:

an intermediate member positioned closely adjacent to the member;

means for attracting one of the liquid images from the member to said intermediate member;

means for removing a substantial portion of the liquid carrier on said intermediate member and securing the toner particles on said intermediate member in image configuration; and intermediate member in image configuration; and

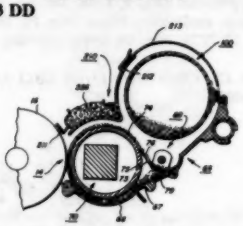
means for transferring toner particles from said intermediate member to the copy sheet in image configuration.

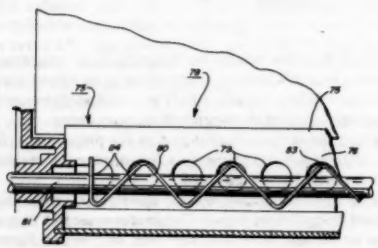
4,690,540

DEVELOPER SYSTEM FOR REPRODUCTION AND PRINTING MACHINES

Eugene J. Manno, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1986, Ser. No. 818,930
Int. Cl.[4] G03G *15/09*
U.S. Cl. 355—3 DD **7 Claims**





1. In a reproduction machine having a movable recording member on which latent electrostatic images are created, developing means for developing the images, and transfer means for transferring the developed images to a copy substrate material, the developing means including a developer housing having a sump for a developer mixture including toner for developing the images on the recording member and a rotatable magnetic brush roll with magnet means for forming a developer brush from developer in said sump on the surface of the magnetic brush roll, so that rotation of the magentic brush roll brings the developer brush into developing relation with the recording member, the combination of:

(a) a developer stripper plate having a developer stripping edge, the surface of said stripper plate adjoining said stripping edge providing a support surface for developer removed from said magnetic brush roll;

(b) means supporting said stripper plate in said developer housing above said sump with said stripper plate stripping edge in operative juxtaposition with said magnetic brush roll to strip developer from said magnetic brush roll as the developing brush formed on said magnetic brush roll moves out of developing relation with said recording member, said stripper plate being inclined so that the removed developer on said stripper plate surface moves downwardly along said stripper plate surface and away from said magnetic brush roll;

(c) at least oe row of developer return holes communicating said stripper plate surface with said sump, said developer return holes being spaced from said stripping edge to enable the removed developer on said stripper plate surface to pass into said sump;

(d) chevron means for mixing the removed developer on said stripper plate to enhance the returned developer mixture; uniformity

(e) means supporting said chevron means in said developer housing in predetermined spaced relation to said stripper plate surface opposite to or upstream of said row of developer return holes; and

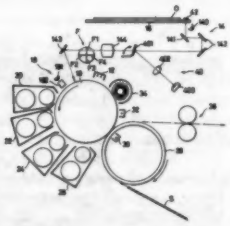
(f) drive means for rotating said chevron means to mix the removed developer on said stripper plate surface as the removed developer is returning to said sump whereby to maintain a substantially uniform developer mix in said sump.

4,690,541

COLOR ELECTROPHOTOGRAPHIC COPYING PROCESS

Yoshihiro Sakai, Tokyo; Itsuo Ikeda; Katsuo Sakai, both of Kanagawa; Tsukasa Adachi, Tokyo; Satoshi Shinguryo, Saitama, and Hideya Furuta, Kanagawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,069
Claims priority, application Japan, Aug. 30, 1984, 59-181459; Sep. 17, 1984, 59-194258; Sep. 17, 1984, 59-194259; Sep. 21, 1984, 59-198368; Sep. 28, 1984, 59-203806
Int. Cl.[4] G03G *13/01, 15/01*
U.S. Cl. 355—4 **16 Claims**



1. A color electrophotographic copying process utilizing the Carlson process, comprising the steps of:

reading a colored original with a solid-state image pickup

device wherein said image pickup device includes a plurality of photographic elements which are covered with respectively red, green and blue filters which are cyclically arranged;

color-separating said colored original;

determining an amount of masking for a color-separated latent image to be masked, based on image information read in said reading step; and

partially erasing the color-separated latent image to be masked in an area-modulating manner with an eraser comprising a light-emitting dot array at an erase ratio depending on the determined amount of masking wherein said light-emitting dot array includes an array of light-emitting elements extending transversely from a photosensitive body wherein said light-emitting elements are turned on and off simultaneously to form a light-spot image wherein said light-spot image is formed by said area-modulating manner of partially erasing with said light-emitting elements being turned on and off without modulation of the light intensities of said elements.

4,690,542

COLOR COPYING APPARATUS

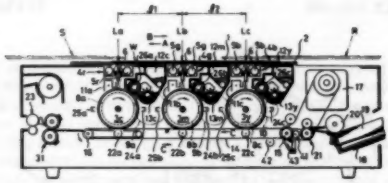
Hideya Furuta, Yokohama; Yutaka Koizumi, Kawasaki; Mitsuru Mamizuka, and Yoshihiro Sakai, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

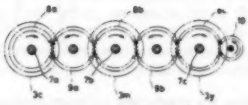
Filed Dec. 24, 1985, Ser. No. 812,947

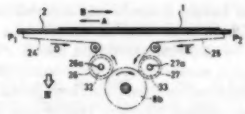
Claims priority, application Japan, Dec. 29, 1984, 59-276677; Dec. 29, 1984, 59-276678; Dec. 29, 1984, 59-276681; Dec. 30, 1984, 59-281073; Dec. 30, 1984, 59-281075

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—4 **7 Claims**







1. A color copying apparatus comprising:

a mounting table adapted to mount an original to be copied thereon and capable of moving for exposing said original to a light;

a plurality of photosensitive members being arranged along a moving path of said mounting table;

exposing units provided correspondingly to each of said photosensitive members, and each having an image exposing portion for receiving a light image of said original exposed to each of said photosensitive members;

whereby latent images are formed by said exposing units, on said respective photosensitive members and, after said latent images are developed, resultant visible images are transferred overlappingly onto a transfer paper;

a first pulley connected, through a first clutch, with one of said photosensitive members in order to rotate;

a wire whose one end is connected with said mounting table and another end is connected with said pulley, and upon rotation of said pulley, allowing said mounting table to move for exposing said original to a light;

and wherein said image exposing portions are arranged along a moving path of said mounting table with an interval corresponding to an integer multiple of a peripheral length of said pulley.

4,690,543

IMAGE FORMING APPARATUS WITH A PLURALITY OF COLORS

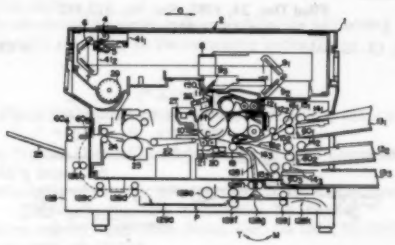
Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 21, 1986, Ser. No. 865,339

Claims priority, application Japan, May 28, 1985, 60-114826

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—4 **2 Claims**



1. An image forming apparatus with a plurality of colors, said apparatus comprising:

an original table for placing thereon an original which possesses at least a first color and a second color;

original scanning means for optically scanning an original placed on said original table, said means having an optical system to feed the image reflecting light coming from the original into a given light path;

color component detection means for transmitting electric signals corresponding to said first and second colors in response to the image reflecting light, said means being movably provided on said light path on which said image reflecting light coming from said optical system of said original scanning means passes;

original color identifying means for identifying different color areas from the electric signals for said first and second colors transmitted from said color component detection means and for storing the color and positional data for the first and second colors in different color areas;

image forming means for forming an image of given colors of the original on an image forming medium by using said image reflecting light coming from said optical system of said original scanning means and by selectively driving a first and a second developing units which correspond to said first and second colors respectively;

image erasing means for selectively erasing an image to be formed by said image forming means;

image forming medium return means for selectively returning said image forming medium to said image forming means after formation of an image by said image forming means;

first control means for producing a first control signal to drive said original scanning means and said color component detection means for a given number of times prior to actual formation of an image;

second control means for reading out, at the time of the first

image forming operation, said first color data that have been stored in said original color identifying means to send them to said first developing unit of said image forming means as drive signals and said second positional data which correspond to said second color data to send them to said image erasing means as erasure data and for producing a second control signal to said image forming medium return means as an instruction for a return operation; and

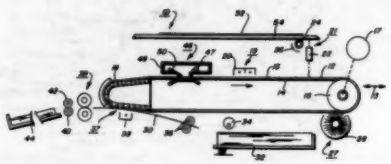
third control means for reading out, at the time of the second image forming operation, said second color data that have been stored in said original color identifying means to send them to said second developing unit of said image forming means and said first positional data which correspond to said first color data to send them to said image erasing means as erasure signals.

4,690,544

BLADE CLEANING APPARATUS FOR FLEXIBLE BELT

Richard L. Forbes, II, Pittsford, and Bruce E. Thorp, Walworth, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 24, 1985, Ser. No. 813,183
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—15 **9 Claims**



1. In an electrostatographic reproducing apparatus comprising an endless flexible belt having an imaging surface thereon supported for movement between two support members defining a substantially horizontal top run therebetween, a blade cleaning station for removing residual toner particles from the imaging surface comprising a rigid stationary cleaning platen under the top run of said belt between said support members for supporting said belt thereon and a cleaning blade mounted in opposed relationship to said cleaning platen on the imaging surface of said belt for removing residual toner therefrom,

said cleaning blade being positioned in interference with said imaging surface on said belt supported by said cleaning platen such that its beam deflection provides the force required to clean the imaging surface and toner cleaned from said imaging surface lubricates the nip between the cleaning blade and the imaging surface.

4,690,545

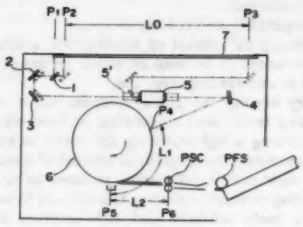
COPYING APPARATUS

Sigeharu Maehara, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Jul. 3, 1986, Ser. No. 881,657
Claims priority, application Japan, Jul. 5, 1985, 60-148782
Int. Cl.[4] G03B *27/48, 27/50, 27/70*
U.S. Cl. 355—51 **3 Claims**

1. In a copying apparatus including an original scanning means adapted to be reciprocated such that relative positions of a leading edge of a copy paper sheet and a front end of an image to be copied are controlled in accordance with a time interval between a point of time of start of scanning of said original scanning means and a point of time of start of transport of the copy paper sheet, the improvement comprising:

means for reciprocating, in a mode for starting scanning of said original scanning means after start of transport of the copy paper sheet, said original scanning means through a short distance at a low speed prior to start of copying of



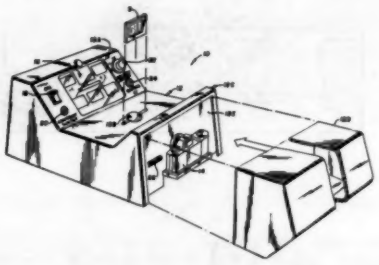
the image onto the copy paper sheet so as to determine a start position of scanning of said original scanning means.

4,690,546

APPARATUS FOR PRODUCING INTERNEGATIVES

Roman Kuzyk, Trenton, N.J.; Richard H. Bender, Gaithersburg, Md., and Lew Edwards, Orlando, Fla., assignors to ECB Technologies, Inc., Washington, D.C.

Filed Sep. 4, 1986, Ser. No. 903,478
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—69 **25 Claims**



1. An apparatus for producing an internegative, comprising:

means for positioning a transparency from which an internegative is to be made;

camera means having a selectively controllable shutter for exposing film therein with an image of a transparency positioned by said first-mentioned means;

first illumination means selectively controllable to project light for a selected time duration through the transparency and into said camera means to expose film in said camera means with an image of the transparency;

second illumination means selectively controllable to project light for a selected time duration into said camera means to expose film therein; and

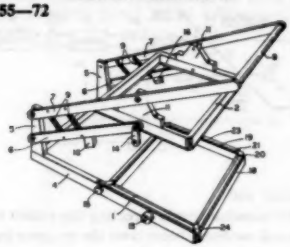
stored-program controlled means coupled to said camera means and said first and second illumination means for selectively opening said shutter and controlling said first illumination means to project light therefrom through said transparency and into said camera means for a selected time duration and for selectively controlling said second illumination means to project light therefrom for a selected time duration into said camera means to effect a contrast correction of the exposed film.

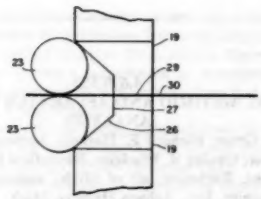
4,690,547

EXPOSING FRAME

Brian E. Shawcross, Cheadle Hulme, England, assignor to CIBA-GEIGY AG, Basel, Switzerland

Filed Sep. 17, 1986, Ser. No. 908,138
Claims priority, application United Kingdom, Sep. 20, 1985, 8523300
Int. Cl.[4] G03B 27/58
U.S. Cl. 355—72 5 Claims





1. A device for holding photosensive material during light exposure which comprises two planar frames of equal size, each of which has two parallel walls and rounded corners, one frame at least being open between its four walls, each frame carrying around its peripheral walls a band of resilient material of rounded cross-section which when the device is in the non-use state is so mounted that part of the band is held above walls of the frame, the sides of each frame being bevelled outwards, together with means to hold in position the two frames separated from each other with the bands of resilient material facing each other, means to force the two frames together so that the bands contact each other substantially over their entire length and force each other down the walls of each frame and means to hold securely the two frames in this position.

4,690,548

METHOD AND APPARATUS FOR THE CONTROL OF A REPRODUCTION CAMERA

Niels E. Holm, Soroe, Denmark, assignor to Danagraf A/S, Soroe, Denmark

Filed Aug. 20, 1985, Ser. No. 767,776
Claims priority, application Denmark, Aug. 31, 1984, 4169/84
Int. Cl.[4] G03B 27/32
U.S. Cl. 355—77 4 Claims

1. A method for the control of a reproduction camera, having work surface for receiving a picture comprising the steps of:

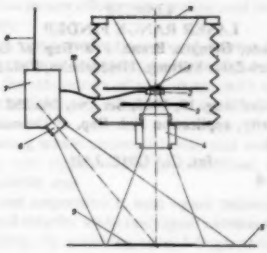
(a) placing the picture on the work surface;

(b) scanning of the entire work surface including the picture in the object plane on the work surface;

(c) reading the scanning image optically on a point-by-point basis to determine the intensity of each point by use of a matrix of a large number of punctiformed photometers, converting the photometers into digital values and thereby creating a matrix of numerical measurements;

(d) analyzing said matrix of numerical measurements to locate the photometers corresponding to the lightest and darkest points, Dmin and Dmax;

(e) setting the exposure of the camera based on Dmin and Dmax;



(f) measuring the reflected light from the work surface after the picture is located thereon, calculating the position and dimensions of the picture by use of the image in the matrix; and

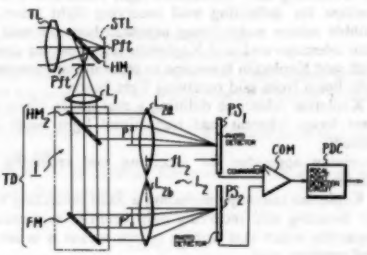
(g) calculating the pictures degree of density and setting the camera according to the measuring under (f).

4,690,549

APPARATUS FOR DETECTING DISTANCE TO AN OBJECT

Yasuo Nakada, Isehara, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 436,614, Oct. 25, 1982, abandoned. This application Feb. 3, 1986, Ser. No. 824,946
Claims priority, application Japan, Oct. 26, 1981, 56-171204; Oct. 27, 1981, 56-171755
Int. Cl.[4] G01C 3/08; G03B 13/20
U.S. Cl. 356—4 19 Claims



1. Apparatus for detecting the distance to an object comprising:

an imaging lens for focussing light from the object;

first lens means for forming the light from the object and passing through said imaging lens into a plurality of light rays which are parallel when the object is disposed at the focal point of said imaging lens and which converge and diverge an amount depending on the direction and amount of displacement of the object from the focal point of said imaging lens;

separating means for separating said light rays from said first lens means into at least two bundles of light;

second lens means for forming each said bundle of light into a separate image at a respective location depending on the amount of convergence and divergence of said light rays;

light sensing means for sensing said locations of said images; and

detecting means for detecting said locations of said images

on said light sensing means and for generating an output varying with the displacement of said images from the locations thereof when the object is at the focal point of said imaging lens.

4,690,550

LASER RANGE FINDER

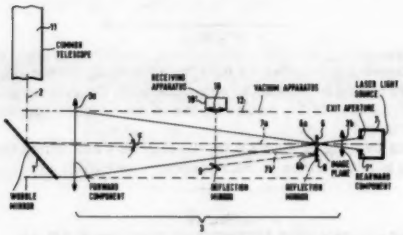
Christoph Kühne, Glengen/Brenz, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Aug. 12, 1985, Ser. No. 764,852

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1985, 8518594

Int. Cl.⁴ G01C *3/08*

U.S. Cl. 356—5 **5 Claims**



1. A laser range finder for use with a common telescope and comprising:

a laser light source for generating and transmitting a transmitted light beam through said common telescope to a target whereat said light beam is reflected into said common telescope in the form of a receiving light beam;

a Keplerian telescope mounted between said common telescope and said laser light source;

wobble mirror means for wobbling between a first position for deflecting said transmitted light beam and a second position for deflecting said receiving light beam, said wobble mirror means being mounted between said common telescope and said Keplerian telescope for coacting with said Keplerian telescope to separate said transmitted light beam from said receiving light beam;

said Keplerian telescope defining a real image plane and a laser focus whereat said transmitted light beam is focussed;

a receiving apparatus for receiving said receiving light beams;

said Keplerian telescope including a fixed deflecting mirror for directing said receiving light beam to said receiving apparatus when said wobble mirror means is in said second position; and,

said fixed deflecting mirror being disposed in said image plans at a location next to said laser focus so as to not shade the latter.

4,690,551

LASER RADAR UTILIZING PULSE-TONE WAVEFORM

Brian E. Edwards, Sterling, and David G. Biron, Westford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 19, 1985, Ser. No. 725,243

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 356—5 **6 Claims**

1. Laser radar comprising:

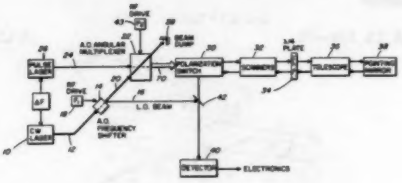
(1) A CW laser;

(2) A pulsed laser;

(3) Means for deriving a local oscillator beam from the CW laser;

(4) Acousto-optic angular multiplexer means for passing the output of the pulse laser when the multiplexer is in the off state and for passing and frequency shifting the output of the CW laser when the multiplexer is in the on state to generate a pulse-tone waveform;

(5) Optical means for launching the pulse-tone waveform toward a target and for receiving a return waveform;



(6) A detector; and

(7) Means for simultaneously directing the return waveform and the local oscillator beam onto the detector to generate a beat signal including both target range and velocity information.

4,690,552

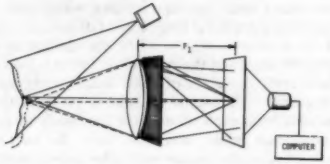
OPTICAL METHOD AND APPARATUS FOR STRAIN ANALYSIS

Ralph M. Grant; Richard E. Haskell; Anthony Paskus, all of Rochester; Stanley R. Windeler, Bloomfield Hills, and Forrest S. Wright, Rochester, all of Mich., assignors to Industrial Holographics, Inc., Auburn Heights, Mich.

Filed Aug. 19, 1985, Ser. No. 766,927

Int. Cl.⁴ G01B *9/02, 11/16*

U.S. Cl. 356—35.5 **7 Claims**



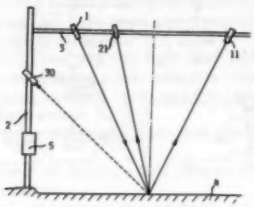
1. In an apparatus for detecting strains in an object resulting from the application of deformation forces, including means for illuminating the object with coherent light, a focussing/shearing optical element operative to receive the coherent light reflected by the object and to generate a plurality of interferring focussed images of the object each shifted laterally with respect to the others, means for recording a first interferogram resulting from the interference of the plurality of focussed images, means for imposing a deforming force to the object, and means for recording a second interferogram resulting from the interference of the plurality of focussed images of the object which result after imposing the deforming force, the improvement wherein the focussing/shearing optical element comprises a focussing optical element and a phase diffraction grating having lines arranged in a plurality of directions including a first plurality of lines extending radially from a common point and a second plurality of lines oriented in radial directions from the common point whose distance from the common point exceed a predetermined distance supported relative to the focussing optical element so that the coherent light reflected by the object passes through both the focussing optical element and the diffraction grating, whereby the interferograms can be analyzed to detect strain in any of the plurality of directions perpendicular to the diffraction grating lines.

4,690,553

ROAD SURFACE CONDITION DETECTION SYSTEM

Hiroshi Fukamizu, Takatsuki; Masaji Nakano, Otokuni; Kunio Iba, Kobe; Taro Yamasaki, Shikama, and Kenji Sano, Kakogawa, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jun. 12, 1980, Ser. No. 158,901
Claims priority, application Japan, Jun. 29, 1979, 54-83112
Int. Cl.[4] G01N *21/47, 21/55;* G08B *19/02*
U.S. Cl. 356—51 11 Claims



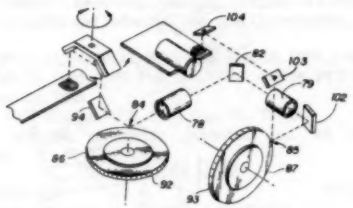
1. Road surface condition detection system comprising:
light projecting means for projecting light including infrared light to a road surface to sense the condition thereof;
said infrared light having a wavelength or wavelengths at which the reflectance of snow is smaller than that of asid road surface in a dry condition,
light receiving means for receiving light reflected from said road surface and for generating output signals representing the luminous energy of said reflected light;
comparison means for comparing said output signals with predetermined reference signals levels corresponding to classified road surface conditions so as to generate comparison output signals representing results of comparison; and
judging means for judging said road surface to be one of said classified road surface conditions in accordance with said comparison output signals.

4,690,554

FINGERPRINT IDENTIFICATION DEVICE

Ronald W. Froelich, 2405 N. Cameron Ave., Covina, Calif. 91724

Filed Dec. 1, 1986, Ser. No. 936,169
Int. Cl.[4] G06K *9/20, 9/74;* G02B *26/10*
U.S. Cl. 356—71 10 Claims



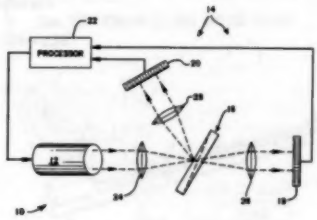
1. A fingerprint identification device for rapid automatic comparison of a latent fingerprint with a known fingerprint, comprising:
a light source illuminating said latent print;
optical projection means interposed between said fingerprints projecting the image of said latent fingerprint in an optical path and superimposing said image on said known fingerprint, said optical projection means including:
a pair of independent coaxial image forming lenses symmetrically disposed with respect to a common intermediate image plane, each of said lenses having an aperture stop location associated therewith,
optical deflection means positioned at each of said aperture stop locations causing said image to traverse said known fingerprint in a repeating pattern, and
optical rotation means effectively rotating said image in said optical path;
sensing means positioned adjacent said known fingerprint, said sensing means being responsive to the radiance produced by the interaction of said image with said known fingerprint and emitting an electrical signal representative of said radiance;
signal processing means connected with said sensing means comparing said signal with a preestablished correlation signal threshold; and
indicator means responsive to said signal processing means and actuated thereby when said signal exceeds said threshold to indicate the matching of said fingerprints.

4,690,555

SOLID-STATE WAVEFRONT SLOPE DETERMINATION

Brent L. Ellerbroek, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 1, 1985, Ser. No. 793,941
Int. Cl.[4] G01J *1/00*
U.S. Cl. 356—121 11 Claims



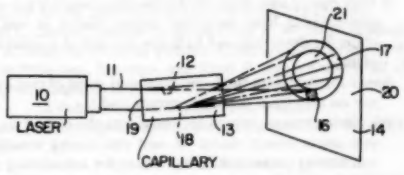
1. A wavefront slope sensor comprising:
means for obtaining a laser beam sample;
means for splitting the sample into two components according to a spatially varying transmittance function which is continuous and monotonic;
means for measuring the intensity distributions of said components; and
a processor for calculating the wavefront slope from said intensity distributions.

4,690,556

CAPILLARY BORE STRAIGHTNESS INSPECTION

Ray A. Walker, Eugene, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Jul. 30, 1985, Ser. No. 760,381
Int. Cl.[4] G01B *11/26*
U.S. Cl. 356—152 27 Claims



1. A method for checking straightness of an elongated gener-

ally cylindrical bore having a substantially smooth surface, comprising,

directing a substantially collimated light beam having a longitudinal axis through the bore,

skewing the bore slightly by a preselected angle with respect to the beam, so that a wall of the bore reflects some of the beam light, forming generally an off-axis ring of reflected light as well as an on-axis spot of non-reflected light beyond the end of the bore, and

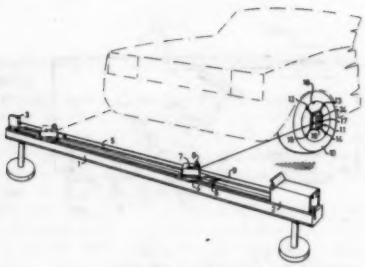
determining scatter of reflected light in directions other than toward of reflected light, indicating non-straightness of the reflecting bore wall.

4,690,557

ARRANGEMENT FOR MEASURING WHEEL ALIGNMENT AND STEERING GEOMETRY IN AN AUTOMOBILE

Klas R. Wiklund, Täby, Sweden, assignor to Nicator AB, Sweden

Filed Jun. 7, 1985, Ser. No. 742,703
Claims priority, application Sweden, Jun. 28, 1984, 8403456
Int. Cl.[4] G01B *11/275*
U.S. Cl. 356—155 **15 Claims**



1. An arrangement for measuring wheel alignment and steering geometry in an automobile of the type having a longitudinal axis and opposing first and second front wheels, wherein each wheel is mounted on a rim, including:

a subtantially horizontal bar placeable in front of the vehicle and essentially at right angles to its longitudinal axis,

at least one light emitting means placed on and displaceable along said bar, for emitting a narrow ray of light at a predetermined angle to said bar,

a measuring unit attachable to the rim,

said measuring unit having means for forming an optical path, means in said optical path for receiving and focusing said light ray at a focal plane, at least three angle sensor means in each measuring unit for detecting angular deviations in three diverging directions, all three directions lying in different planes from each other, each angle sensor means having means for delivering an output signal,

at least one of said angle sensor means comprising a widely dimensioned light detecting means placed in said focal plane for detecting said light ray focused at a point in said plane,

means for detecting the location of said point of said focused ray on said light detecting means and

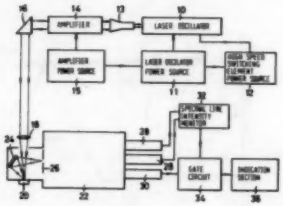
calculating means, means for providing the output signal of said angle sensor means to said calculating means, said calculating means including means for calculating wheel alignment values in response to said output signals from said angle sensors obtained at different rotational positions of the wheel.

4,690,558

METHOD OF LASER EMISSION SPECTROSCOPICAL ANALYSIS AND APPARATUS THEREFOR

Kouzou Tsunoyama, Chiba; Yoshiharu Ohashi, Setagaya; Yasuko Furunushi, and Motoyuki Konishi, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Japan

Filed Dec. 18, 1984, Ser. No. 682,835
Int. Cl.[4] G01N *21/63*
U.S. Cl. 356—318 **6 Claims**



1. A method of laser emission spectroscopial analysis, wherein the light emitted from the surface of a sample when a pulsed laser beam irradiates the surface of the sample is spectroscopically analyzed, characterized in that said method includes the steps of:

(1) fixing the emission mode of the laser beam to a guass distribution type TEM_{00} mode; and

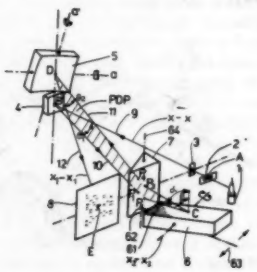
(2) measuring the spectral line intensity of a sample element only when the intensity ratio between a pair of preset spectral lines in the light emitted from the sample is within a preset range.

4,690,559

OPTICAL SYSTEM FOR SPECTRAL ANALYSIS DEVICES

Stefan Florek; Helmut Becker-Ross, both of Berlin; Hans-Jürgen Dobschal, Jena, and Joachim Mohr, both of Jena, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Jun. 14, 1985, Ser. No. 744,861
Claims priority, application German Democratic Rep., Jul. 2, 1984, 2647890; Aug. 20, 1984, 2664168
Int. Cl.[4] G01J *3/18*
U.S. Cl. 356—328 **16 Claims**



1. An optical system for spectral analysis devices comprising a dispersion member having a surface provided with a dispersing structure and a dispersion plane at right angles to said surface and to a principal direction of said dispersing structure, a concave collimating reflector having a first vertex and a first radius of curvature R,

a concave camera reflector having a second vertex and a second radius of curvature R,

said collimating reflector and said camera reflector being

adjacently arranged remote and at the same distance from said dispersion member,

said first and said second vertex being located in said dispersion plane,

said first radius of curvature R and said second radius of curvature R being equal,

an excitation light source for emitting a light beam along a first optical axis,

said light source being arranged in the vicinity of said dispersion member on one side of said dispersion plane,

said first optical axis connecting said light source and said first vertex,

said collimating reflector being for producing a reflected beam from said light beam and directing the same to said dispersion member,

said reflected beam and said light beam including a first angle θ and defining a first reflection plane,

an aperture being arranged about said first optical axis adjacent said light source,

said aperture comprising a horizontal slit and a vertical slit,

said horizontal slit having a first distance r_s to said collimating reflector,

said vertical slit having a second distance r_t to said collimating reflector,

a focal plane on the side of said dispersion plane opposite said first side in the vicinity of said dispersion member,

said focal plane having a center,

said center and said aperture being substantially equidistantly positioned to said dispersion plane,

a second optical axis connecting said center of said focal plane and said second vertex,

said dispersion member being for producing a dispersed beam from said reflected beam and directing the dispersed beam to said camera reflector,

said second optical axis and said dispersed beam including a second angle θ and defining a second reflection plane,

said first and said second angle θ being equal,

said first and said second reflection plane being substantially at right angles to said dispersion plane,

said reflected beam, when impinging upon said dispersion member, producing a point of impingement,

said reflected beam and a perpendicular line erected on said surface of said dispersion member at said point of impingement including an angle α,

said dispersed beam and said perpendicular line including an angle β.

4,690,560

OPTICALLY BASED MEASUREMENT OF FLUID PARAMETERS

Clive K. Coogan, Canterbury, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

PCT No. PCT/AU84/00122, § 371 Date Feb. 28, 1985, § 102(e) Date Feb. 28, 1985, PCT Pub. No. WO85/00426, PCT Pub. Date Jan. 31, 1985

PCT Filed Jun. 29, 1984, Ser. No. 717,264

Claims priority, application Australia, Jun. 30, 1983, PG0051/83

Int. Cl.⁴ G01N *21/49*

U.S. Cl. 356—338 **8 Claims**

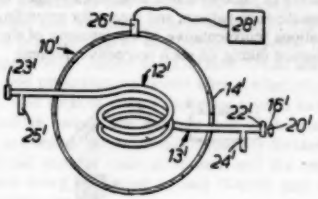
1. Optical measurement apparatus comprising:

an elongate tubular sample cell (12) adapted to receive fluid for testing;

a light source (16) arranged to direct an incident light beam into the cell; and

hollow light integration means (14', 26') about said cell to detect at least a pre-determined portion of light emitted by the cell transversely of the direction of said incident light beam, said cell being transparent to such emitted light;

wherein the light source and the cell are arranged so that said incident light beam is not collimated but, as it traverses said cell, is confined to the cell by total internal reflection, unless otherwise scattered by particles in the cell;



and wherein said tubular sample cell is coiled within said light integration means so as to substantially increase the path length of the incident light beam within the light integration means.

4,690,561

PARTICLE ANALYZING APPARATUS

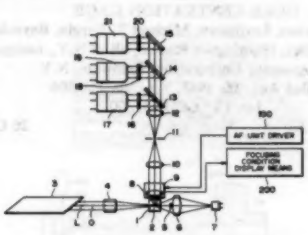
Yuji Ito, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1986, Ser. No. 818,263

Claims priority, application Japan, Jan. 18, 1985, 60-007038; Jan. 18, 1985, 60-007039; Jan. 18, 1985, 60-007040; Jan. 19, 1985, 60-008101

Int. Cl.⁴ G01N *21/00*; G01B *11/00*

U.S. Cl. 356—339 **20 Claims**



1. A particle analyzing apparatus comprising:

an irradiating optical system for irradiating a particle to be examined with a light beam, wherein said particle flows in a flow section in a flow cell comprising said flow section wherein said flow cell has two opposed inner walls;

a measuring optical system for measuring light scattered by said particle;

an optical detection system for projecting a positioning light beam onto said flow cell and detecting the light reflected by said two opposed internal walls; and

means for varying the relative position of said measuring optical system with respect to said flow cell in response to the output of said optical detection system.

4,690,562

GAS ANALYSIS APPARATUS AND METHOD

William L. Davies, Stanton St. John; Clive E. W. Hahn, Radley; Roy K. Jackson, Oxford; Thomas A. McGraghan, Fringeford; Eileen Palayiwa, Marston, and Basil R. Sugg, Oxford, all of England, assignors to Penlon Limited, England

Filed Jun. 19, 1985, Ser. No. 746,338

Claims priority, application United Kingdom, Jun. 20, 1984, 8415670

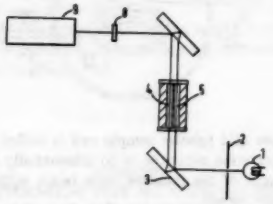
Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—361 **20 Claims**

20. In a gas analyser for analysing the constitution of gases which comprises means for produing an interference pattern,

displacements of said pattern being indicative of changes of the constitution of a gas being analysed, the improvement therein comprising:

an array of photosensitive elements arranged to receive said interference pattern, and means for providing digital indications representative of the intensity of the interference pattern falling on each respective element;



means for providing a stored pattern representing a relatively large portion of said interference pattern, such stored pattern being stored with a resolution which is finer than the resolution of the interference pattern; and

processing means for determing the best fit of said digital indications from said photosensitive elements with said stored pattern whereby to determine the relative position of at least one principal peak of said interference pattern received by said array of photosensitive elements.

4,690,563

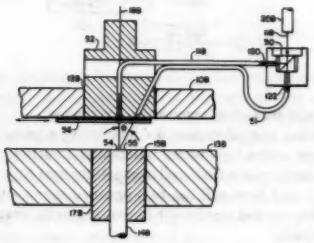
HOLE CENTRATION GAGE

Richard O. Barton, Levittown; Michael T. Bergin, Bayside, and John M. Miller, Huntington Station, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,506

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—375 **26 Claims**



1. An apparatus for determining the position of a first hole with respect to a second hole along the x, y, and z axes thereof, said apparatus having means at said first hole for providing electromagnetic radiation, and having radiation conducting means comprising:

first means for transmitting the radiation from the radiation providing means along a path that is collinear with a central axis of said first hole,

second means for transmitting said radiation from said radiation providing means along a path that is oriented at a predetermined angle with respect to said central axis of said first hole,

means for alternately blocking selectively said radiation transmitted from said first and second transmitting means,

position sensitive means responsive to said radiation for receiving said radiation transmitted from said radiation transmitting means, said radiation received from said first transmitting means by said receiving means illuminating a first point of a plurality of points to provide a first offset measurement corresponding to the relative position of said first hole with respect to said second hole along the x and the y axes,

said radiation received from said second transmitting means by said receiving means illuminating a second point of said plurality of points to provide a secodn offset measurement corresponding to the relative position of said first hole with respect to said second hole along the z axis.

4,690,564

DEVICE FOR MEASURING INK DENSITY ON PRINTED SURFACES

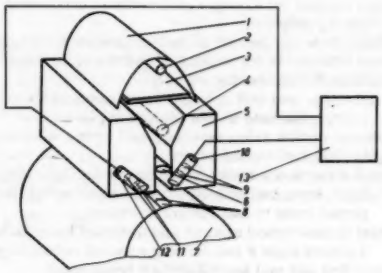
Bernd Morgenstern, Lützschena; Helmut Weigend, and Peter Reinhardt, both of Leipzig, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Nov. 5, 1984, Ser. No. 668,074

Claims priority, application German Democratic Rep., Nov. 14, 1983, 256651

Int. Cl.[4] B41F *33/00*; G01N *21/47*

U.S. Cl. 356—445 **3 Claims**



1. A device for measuring ink density on a measured surface of a printed material in a running printing machine, comprising an elliptic reflector having two focal points, one of said focal points being completely enclosed in said reflector, an actual light source arranged in said one focal point so as to generate an image light source in the other forcal point which is equivalent to the actual light source, means for directing a narrow light beam from said image light source at right angles to the measured surface, light sensors provided above the measured surface to detect remitted light, and evaluating means for converting the signals from the sensors into ink density values.

4,690,565

OPTICAL APPARATUS FOR THE DETECTION OF SCATTERED LIGHT

Kinya Kato, and Hiroyuki Tsuchiya, both of Tokyo, Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Mar. 13, 1985, Ser. No. 711,163

Claims priority, application Japan, Mar. 19, 1984, 59-53347

Int. Cl.[4] G01B *11/02*

U.S. Cl. 356—446 **9 Claims**

1. Apparatus for the detection of scattered light from a test object, said apparatus comprising:

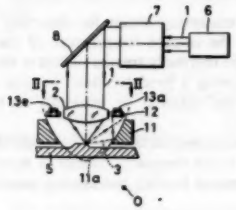
light source means for supplying a beam of light having a predetermined wavelength;

objective lens means having an objective lens and a lens tube mounting the objective lens therein, said objective lens focusing the light beam from the light source means on the test object;

annular light converging means disposed around an end of the objective lens means near the test object for receiving scattered light from the object and for converting the scattered light into a beam of collimated light rays substantially parallel with an optical axis of the objective lens;

an annular filter member disposed around said end of the objective lens means for filtering the collimated light rays from said annular light converging means, said annular filter member being constructed to transmit the collimated light rays of said predetermined wavelength while filtering off light rays of other wavelengths;

photo sensor means mounted on the annular filter member at



an exit side thereof for receiving the collimated light rays transmitted by the annular filter member and for generating electric signals corresponding to the intensity of the received light rays; and

a holder ring member mounted on said lens tube and supporting said annular light converging means and said annular filter member around the periphery of the lens tube.

4,690,566

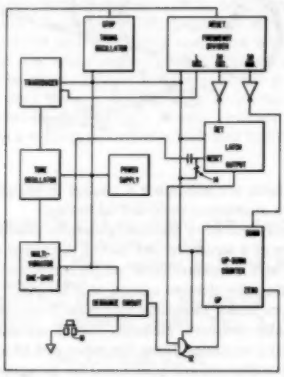
PROGRAMMABLE TIMING DEVICE

Anthony L. Robertsen, Anaheim Hills, Calif., assignor to Elite Concepts, Inc., Laguna Niguel, Calif.

Filed Dec. 8, 1986, Ser. No. 939,406

Int. Cl.[4] G04B *23/12*

U.S. Cl. 368—108 **4 Claims**



1. In an improved programable timing device, having a programming circuit, a timing circuit, a signal circuit, and a source of electrical power connected to the electrically functioning elements of said circuits:

(a) said programming circuit including an up-down counter having an input terminal and a zero detector terminal, a programming switch connected to the input terminal of the counter and adapted to program and counter up by introducing pulses thereto, and a NAND gate in said connection between said switch and counter;

(b) said timing circuit including a timing oscillator and a frequency divider, the output of said timing oscillator being connected to the input of said frequency divider, said frequency divider having a plurality of outputs, each output being a different multiple of the frequency of the timing oscillator, one of said frequency divider outputs being connected to said up-down counter and adapted to down count said counter;

(c) said signal circuit having an input connected to said zero detector terminal of said counter and adapted to be activated when said counter counts down to zero from pulses received from said one of said frequency divider outputs;

(d) the improvement comprising a lockout circuit adapted to disable said programming circuit after a selected interval of time, said lockout circuit including a latch having an input and an output, the input to said latch being connected to a second output of said frequency divider representing said selected interval of time, and the output of said latch being connected to said NAND gate in said programming circuit.

4,690,567

ELECTRICAL CONNECTION ARRANGEMENT BETWEEN THE BRACELET AND THE CASE OF AN ELECTRONIC APPLIANCE TO BE WORN ON THE WRIST

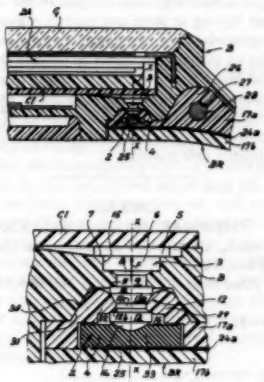
Jean-Philippe Rebeaud, Cressier, Switzerland, assignor to ETS SA Fabriques d'Ebauches, Granges, Switzerland

Filed Nov. 29, 1985, Ser. No. 802,915

Claims priority, application Switzerland, Dec. 10, 1984, 05847/84

Int. Cl.[4] G04B *1/00, 37/00*

U.S. Cl. 368—203 **9 Claims**



1. An electrical connection arrangement between portions of a circuit located respectively in the case and the bracelet of an electronic appliance to be worn on the wrist, said connection arrangement comprising:

at least one electrical path means inserted between portions of a circuit located respectively in a case and a bracelet of an electronic appliance to be worn on the wrist, said path means comprising a set of mating contacts which are separable but maintained applied to one another by a latching effect, said set of contacts exhibiting at least partially a rotation symmetry defining an axis;

means associated with said set of mating contacts for generating an elastic force directed along said axis of said set of mating contacts so as to achieve said latching effect; and

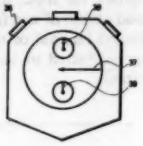
complementary abutment surfaces provided respectively on the bracelet and the case, said complementary abutment surfaces surrounding said mating contacts and being applied against one another also by said latching effect in such a manner as to seal said mating contacts off from the exterior.

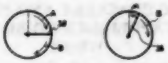
4,690,568

BATTERY LIFETIME INDICATOR FOR A STOPWATCH

Hiroshi Odagiri, and Isamu Nishida, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,765
Claims priority, application Japan, Oct. 5, 1984, 59-209359
Int. Cl.[4] G04B *1/00*
U.S. Cl. 368—204 18 Claims





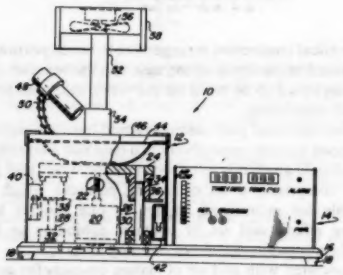
1. In a stopwatch energized by a battery and having a hand rotationally driven in a step-by-step manner by driving pulses, a battery lifetime indicator for indicating the lifetime of the battery comprising: battery lifetime detection circuit means for detecting the output voltage of the battery and generating a detection signal according to the amount of the output voltage; control means having at least one switch manually operative when the stopwatch is not being used to indicate elapsed time for generating an instruction signal to initiate the battery lifetime indicator; and battery lifetime display circuit means initiated by the instruction signal and responsive to the detection signal for generating a predetermined number of driving pulses effective to drive the hand to a predetermined rotational angular position from a rest position.

4,690,569

THERMAL PROFILE SYSTEM

Randall C. Veitch, Allentown, Pa., assignor to Qualtronics Corporation, Palm, Pa.

Filed May 22, 1986, Ser. No. 865,761
Int. Cl.[4] G01N *25/00*
U.S. Cl. 374—11 14 Claims



1. Apparatus for the implementation of a characterized thermal profile of a temperature/time dependent process upon a preselected material or materials comprising:

a substantially rectangular thermally transparent platform capable of supporting the material or materials to be thermally treated having a preselected locus or target area for the placement of said material or materials;

a source of heat energy;

a means for moving said source of heat energy either closer to or farther away from the material or materials to be thermally treated;

a means for creating a controlled air flow through said platform to provide more gradual temperature increases and decreases to the material or materials to be thermally treated;

a temperature measuring means for detecting increases or decreases in the surface temperature of the material or materials to be thermally treated placed in the target area;

a means for storing a predetermined heating and cooling pattern for the material or materials to be thermally treated; and,

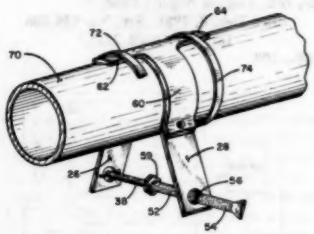
a means for controlling the thermal treatment of the material or materials to be thermally treated in accordance with the predetermined heating and cooling pattern.

4,690,570

C-SHAPED FAILURE DETECTOR FOR STEAM TRAPS

Donald W. Wall, 6850 Washington St. N.E., Minneapolis, Minn. 55432

Filed May 19, 1986, Ser. No. 864,312
Int. Cl.[4] G01K *05/70*
U.S. Cl. 374—188 17 Claims



1. Apparatus for indicating a change in temperature at the surface of a monitored structure including:

a thermally sensitive element generally conforming to the surface of a structure and having a normal configuration when at a predetermined temperature, and a means for mounting the element against said surface;

a first arm means integrally extended from one end of said thermally sensitive element, and a second arm means integrally extended from the other end of said thermally sensitive element and positioned for movement relative to the first arm means responsive to thermally induced flexure of said element;

an indexing member mounted to said first arm means for movement with said first arm means and positioned at a select location relative to said second arm means, corresponding to the normal configuration of said element, and movable along with said first arm means, and relative to said second arm means, away from the select location responsive to the thermally induced flexure of said element away from said normal configuration; and

an indexing means on said indexing member and cooperating with said second arm means to indicate a deviation of said indexing member relative to said second arm means from said select location, thereby to indicate a difference in element temperature from said predetermined temperature.

4,690,571

PULLOUT GUIDE ASSEMBLY FOR MOUNTING SLIDING FURNITURE PARTS

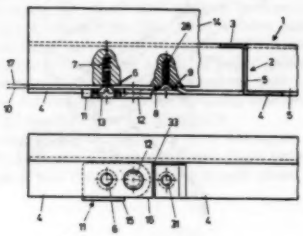
Manfred Fulterer, Lustenau, Austria, assignor to Fulterer Gesellschaft m.b.H.

Filed May 22, 1986, Ser. No. 866,327

Claims priority, application Austria, Jun. 17, 1985, 1787/85

Int. Cl.[4] F16C *29/12*; A47B *88/00*

U.S. Cl. 384—22 **6 Claims**



1. A pullout guide assembly for mounting a sliding furniture part such as a drawer or shelf on furniture comprising: a first rail section serving as a guide rail attached at a side wall of said furniture; at least one second rail section serving as a sliding rail attached to said sliding furniture part, said second rail section having one of an L- or Z-shaped cross-sectional configuration including a lower horizontal leg having said sliding furniture part attached thereto; means provided between said first and second sections to enable sliding movement therebetween; adjustment screw means interposed between said second rail section and said sliding furniture part operable to enable height adjustment of said furniture part with respect to said horizontal leg, said adjustment screw means including an adjustment screw threadedly engaged in said furniture part having a head portion retained in engagement with said horizontal leg to restrain axial mobility of said screw with regard to said horizontal leg while enabling relative rotation therebetween; and a flat upwardly bent bracket provided at said horizontal leg having a bore therethrough for receiving an attachment screw threadedly engaged in said furniture part, said bracket having a support face upon which said furniture part is supported.

4,690,572

STATIC PRESSURE GAS BEARING APPARATUS FOR TURBOCHARGER

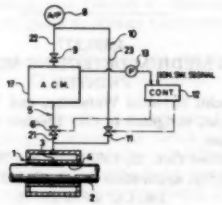
Naoto Sasaki, Zushi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 31, 1986, Ser. No. 925,220

Claims priority, application Japan, Nov. 1, 1985, 60-168637[U]

Int. Cl.[4] F16C *32/06*

U.S. Cl. 384—120 **5 Claims**



1. A static pressure gas bearing apparatus equipped with a static pressure bearing that can support in floated state the rotating shaft of the turbocharger to be placed on an internal combustion engine, said apparatus comprising:

air pump means for pressurizing and supplying a gas;

an accumulator for storing the pressurized gas supplied from said air pump means;

pressurized gas supply passage means for connecting said accumulator to the static pressure gas bearing;

bypass passage means for connecting said air pump to the static pressure gas bearing by bypassing said accumulator; and

control means for controlling the opening and the closing of said bypass passage means in response to the internal pressure of said accumulator.

4,690,573

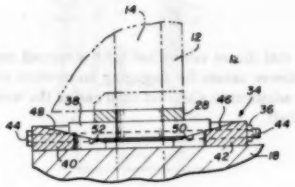
ADJUSTER FOR THRUST WASHER WEAR

Joseph L. Huffman, Marion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 7, 1986, Ser. No. 928,214

Int. Cl.[4] F16C *25/02*

U.S. Cl. 384—251 **4 Claims**



1. A take up adjuster for a swivel mounted on a structure for swiveling about a pin comprising:

a. an adjusting body positioned about said pin between said swivel and said structure, said adjusting body comprising;

i. a first pair of wedge plates having sloping surfaces and positioned on diametrically opposed sides of said pin,

ii. a second wedge positioned about said pin and having sloping surfaces complimentary to and in sliding engagement with said sloping surface of said first pair of wedge plates,

b. means for containing said second wedge in sliding engagement with said first of pair wedge plates, and

c. means for moving said first pair of wedge plates toward each other so as to raise said second wedge and eliminate unnecessary space between said swivel and said structure as wear occurs from use.

4,690,574

BEARING AND METHOD FOR ROTATABLY SUPPORTING A WORN SHAFT

Bernard Green, South Euclid, Ohio, assignor to The Green Ball Bearing Company, Cleveland, Ohio

Filed Nov. 17, 1986, Ser. No. 931,614

Int. Cl.[4] F16C *25/06*

U.S. Cl. 384—569 **8 Claims**

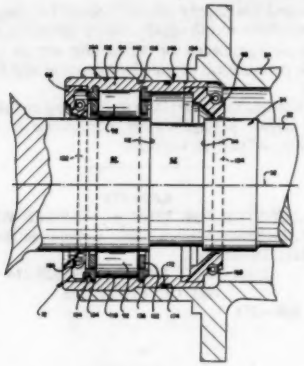
1. An apparatus for use in rotatably supporting a shaft having an annular worn portion and unworn portions disposed adjacent to axially opposite ends of the worn portion, said apparatus comprising:

bearing means for engaging the unworn portion of the shaft at a location adjacent to a first axial end of the worn portion of the shaft;

sleeve means for enclosing said bearing means and the worn portion of the shaft;

first seal means connected with a first end portion of said sleeve means for engaging an unworn portion of the shaft adjacent to said bearing means and at a location spaced from the worn portion of the shaft by an axial distance

which is at least as great as the axial extent of engagement of said bearing means with the unworn portion of the shaft; and



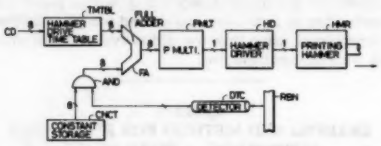
second seal means connected with a second end portion of said sleeve means for engaging an unworn portion of the shaft adjacent to a second axial end of the worn portion of the shaft.

4,690,575

DEVICE FOR CONTROLLING PRINTING PRESSURE ACCORDING TO THE KIND OF INK RIBBON BEING USED

Hiroyuki Ueda, Kawasaki, and Yoshihiro Kobata, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 693,236, Jan. 22, 1985, abandoned, Continuation of Ser. No. 462,186, Jan. 31, 1983, abandoned. This application Oct. 10, 1986, Ser. No. 917,312
Claims priority, application Japan, Feb. 17, 1982, 57-25093
Int. Cl.[4] B41J *9/38*
U.S. Cl. 400—166 **5 Claims**



1. A printing device capable of printing with two types of ink ribbon, one of which is usable a plurality of times and the other of which is usable only once, said device comprising:

print pressure information generating means responsive to a code representing a character to be printed for generating print pressure information that varies depending on the character;

means for identifying the type of ink ribbon to be used for printing to determine whether the ink ribbon is usable a plurality of times or usable once;

means for performing an arithemtic operation on said print pressure information, in accordance with the identification of the type of ink ribbon to be used for printing, to produce an arithmetic operation result; and

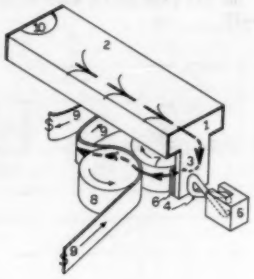
print pressure providing means for providing a print pressure for printing the character in accordance with the arithmetic operation result.

4,690,576

AUTOMATIC RIBBON RE-INKER

John S. Cory, 1436 View Pointe Ave., Escondido, Calif. 92027

Filed Jan. 13, 1986, Ser. No. 818,474
Int. Cl.[4] B41J *31/14, 32/00*
U.S. Cl. 400—200 **6 Claims**



1. An automatic ribbon re-inker improvement to a pre-existing inked-ribbon transport means for impact printers, comprising

an inked ribbon,

a ribbon transport means using pinch rollers, with at least one of said rollers constructed to essentially block diffusive ink flow,

a pinch roller driver means, and

a support means for its elements;

the improvement comprising

an ink reservoir to store and dispense ink, constructed from an ink absorptive material, with a volume greater than eight times (a) the average initial ink usage rate preferred for the printer, times (b) the operational lifetime of the unmodified ribbon transport mechanism, divided by (c) the saturation concentration of the reservoir material, and,

with a cross sectional area greater than the (a) reservoir length times (b) the average initial ink usage rate preferred for the printer divided by (c) the saturation concentration of the reservoir material divided by (d) the diffusivity of the reservoir material,

a feeder tab to conduct ink by diffusion, extending from one end of the said reservoir to the ribbon drive surface of said diffusion blocking pinch roller of the inked-ribbon transport mechanism,

a pressing force device forcing the said feeder tab against the inked-ribbon drive surface of the said ink diffusion blocking pinch roller,

a restrainer device supporting one end of said pressing force device, to conduct both pressing and sideways forces from said pressing force device to the said support means for the elements of the said inked-ribbon transport mechanism.

4,690,577

PRINTING MEDIUM DETECTING MECHANISM OF PRINTER

Hiroshi Kikuchi; Shyoichi Watanabe, and Yukio Ohta, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,696
Claims priority, application Japan, Oct. 25, 1984, 59-222990
Int. Cl.[4] B41J *29/46*
U.S. Cl. 400—708 **10 Claims**

1. A printing device, comprising:

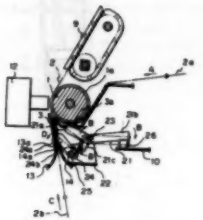
a platen having a bottom side, a print head facing side spaced from said bottom side, for facing a print head, and a de-

tecting groove at its circumferential periphery outside a printing region of said platen;

first printing medium guiding means for guiding a printing medium along a first path extending along the bottom side of said platen to a position between said print head facing side and the print head, said first printing medium guiding means including a paper chuted beneath said bottom side defining a portion of said first path between said paper chute and said bottom side;

second printing medium guiding means for guiding a printing medium along a second path extending from beneath said printing device to said position between said print head facing side and the print head without passing along said portion of said first path, said second printing medium guiding means including a pair of paper guides defining therebetween a portion of said second path below said position between said print head facing side and the print head and spaced from said first path;

a first printing medium detecting lever having an end pivotable through a first slit in said paper chute between a first position in said detecting groove in said platen along said



portion of said first path in response to the absence of a printing medium in said portion of said first path, and a second position spaced from said detecting groove in response to presence of the printing medium in said portion of said first path, said first lever being biased toward said first position;

a second printing medium detecting lever having an end pivotable through a second slit in said pair of paper guides between a third position in said portion of said second path in response to the absence of a printing medium in said portion of said second path, and a fourth position outward of said third position in response to the presence of the printing medium along said portion of said second path, said second lever being biased toward said third position, said first and second levers having means for pivoting said end of said first lever from said first postion to said second position when said second lever is pivoted from said third position to said fourth position; and

sensor means for sensing when said end of said first lever is in said second position, thereby to sense when a printing medium is in one of said first and second paths.

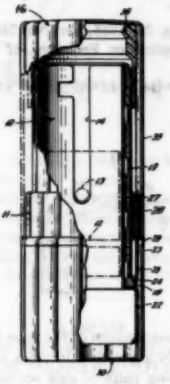
4,690,578

COSMETIC CONTAINER CONSTRUCTION

Eric J. Idec, Madison, and Thomas F. Holloway, Southbury, both of Conn., assignors to Risdon Corporation, Naugatuck, Conn.

Filed Sep. 8, 1986, Ser. No. 904,646
Int. Cl.[4] A45D *40/06, 40/00*
U.S. Cl. 401—78 **5 Claims**

1. In a swivel lipstick or the like container having an open end for the dispensing of cosmetic substance, wherein a central carrier member of the container has a cam follower engaged to propulsion cams of inner and outer tubular members which are relatively rotatable to develop propel/repel displacement of the carrier member with respect to the open end of the container, and wherein a closure cap is removably applicable over the open end and in longitudinal overlap of the propulsion-cam region of the container with friction engagement to one of said tubular members, the improvement wherein the inner tubular member is of metal and is characterized by a radially outward shoulder formation between an elongate upper propulsion-cam portion of lesser diameter and a circumferentially continuous cylindrical base portion of greater diameter, wherein the outer tubular member includes a sleeve of molded plastic with an elongate cam-characterized bore in running clearance with the upper portion of said inner tubular member, and wherein the outer tubular member integrally includes a circumferentially continuous radially outward flange in axial engagement with said shoulder formation and of diameter less than said greater diameter, a circumferentially continuous tubular metal adapter



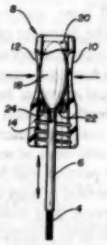
member with a lower cylindrical portion having an outer diameter equal to said greater diameter, said adapter member including at its lower end a radially inward flange in axially abutting relation with the upper surface of said outer tubular member, and a base cup member having a bore of greater axial extent than the base of said inner tubular member and in permanent metal-to-metal force-fitted assembly to both said greater-diameter cylindrical surfaces, namely to the base of said inner tubular member and to at least the lower end of said adapter member, said force-fitted assembly being characterized by axial engagement of said adapter flange and of said shoulder to the respective upper and lower surfaces of said plastic sleeve flange.

4,690,579

BRUSH EXTENSION DEVICE

Drew E. Tuckman, 25-15 Fair Lawn Ave., Fair Lawn, N.J. 07410

Filed Sep. 3, 1985, Ser. No. 772,012
Int. Cl.[4] A45D *34/00*; A46B *11/00*
U.S. Cl. 401—127 **11 Claims**



1. In a cap having a shaft and liquid pick-up means attached thereto, the improvement which comprises means for extending the length of said liquid pick-up means by moving the shaft

relative to said cap, said improvement including sealed gas filled flexible means mounted within said cap and coupled to said shaft, said flexible means on compression thereof, causing said shaft to move relative to said cap.

4,690,580

RING BINDER MECHANISM WITH MATING RINGS

Karl-Heinz Kissel, Espelkamp, Fed. Rep. of Germany, assignor to Robert Krause GmbH & Co. KG, Espelkamp, Fed. Rep. of Germany

Filed Aug. 26, 1985, Ser. No. 769,530

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1984, 3433124

Int. Cl.[4] B42F *13/20, 13/22, 13/30*

U.S. Cl. 402—39 4 Claims

1. In a ring binder mechanism of the type in which two ring sections are resiliently supported in pairs to form rings, the combination comprising pairs of ring sections having a non-round cross section, each ring section of a pair having free end portions, each of said free end portions having a terminating end face, one of said free end portions of a pair comprising a first and a second external frusto-conical portion and a cylindrical portion disposed between said first and second frusto-conical portions, said first external frusto-conical portion having its larger diameter end joined to the respective non-round ring section and its small diameter end jointed to one longitudinal end of said cylindrical portion, said smaller diameter end of said first external frusto-conical portion being equal to the diameter of said cylindrical portion and being coincident with one longitudinal end of said cylindrical portion, said second external frusto-conical portion having its smaller diameter end coincident with the terminating end face of said one free end portion and the larger diameter end equal to the diameter of said cylinder portion and coincident with the other longitudinal end of said cylindrical portion, the other of said free end portions of a pair having a cylindrical bore and an internal frusto-conical portion opening up onto said terminating end face of said other free end portion, said internal frusto-conical portion having its smaller diameter and equal to the diameter of said cylindrical bore and coincident with one longitudinal end of said cylindrical bore, said cylindrical bore having a diameter greater than the diameter of said cylindrical portion, said first external frusto-conical portion and said internal frusto-conical portion each having a cone angle of about forty-five degrees, said cylindrical portion being insertable into said cylindrical bore to a depth at which said first external frusto-conical portion mates with said internal frustoconical portion to thereby provide a frusto-conical seating surface, said second external frusto-conical portion and said internal frustoconical portion facilitating insertion of said one free end portion into said other free end portion, said frusto-conical seating surface preventing initial transverse displacement between said one and said other free end portions and the engaging of said cylindrical portions with said cylindrical bore preventing further transverse displacement between said one and said other free end portions.

4,690,581

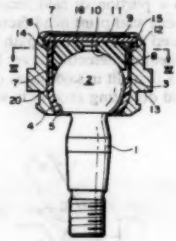
BALL JOINT

Yonetsugu Umemoto; Hiroshi Shirasawa, both of Toyota; Muneya Ogo, Nishio; Kazumasa Kinoshita, Nishio, and Tetsuo Kondo, Nishio, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Odai Tekko Kabushiki Kaisha, both of Aichi, Japan

Filed May 10, 1985, Ser. No. 732,623

Int. Cl.[4] F16C *11/06*

U.S. Cl. 403—133 3 Claims



1. A ball joint comprising;

a socket having an inner surface;

a ball mounted in the socket;

a stud extending from the ball;

a synthetic resin ball seat positioned in the socket for supporting the ball for rotation about its center;

said socket having an opening at the side opposite to the stud;

a cap for urging the ball seat against the ball and closing the opening of the socket at the side opposite to the stud;

the ball seat including a first, substantially hard ball seat member having an inner spherical surface and covering a portion of the ball adjacent to the stud and having a cylindrical wall extending axially along the inner surface of the socket to the proximity of the socket opening, said cylindrical wall having an inner surface, and a second, substantially soft ball seat member having an inner spherical surface and an outer surface retained within the cylindrical wall and covering a portion of the ball at the side opposite to the stud, said second ball seat member being compressed by said cap thereby causing radial expansion of said second ball seat member;

the first ball seat member having at the inner surface of the cylindrical wall a plurality of linear projections extending axially and terminating in ends substantially defining a cylinder having a diameter, and having an axial length longer than that of the second ball seat member, said linear projections penetrating the outer surface of the second ball seat member, said second ball seat member having in an uncompressed state a first outer diameter approximately equal to or slightly smaller than the diameter of the cylinder defined by the ends of the linear projections, and a second outer diameter larger than the diameter of said cylinder but smaller than the inner surface of the cylindrical wall of the first ball seat member when said second ball seat member is compressed axially by the cap, whereby said linear projections penetrate into the outer surface of said second ball seat member.

4,690,582

CONNECTING ELEMENT FOR STRUCTURAL FRAMEWORK

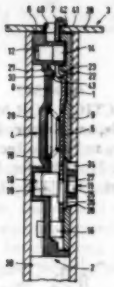
Helmut Maier, Schonenböch, Switzerland; Bruno Neumann, Eupen, Belgium, and Ludwig R. Schaafhausen, Frankfurt am Main, Fed. Rep. of Germany, assignors to Exibelco GmbH, Basel, Switzerland

Filed Oct. 15, 1985, Ser. No. 787,425

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1984, 3437805

Int. Cl.[4] B25G *3/00*; F16B *9/00*

U.S. Cl. 403—252 28 Claims



1. A connecting element for detachably joining an elongate first sectional bar to an elongate second sectional bar, the first sectional bar having a longitudinal recess extending inwardly from one end face thereof and a transversely extending bore communicating with said recess substantially at an inner end thereof, the second sectional bar being provided with a longitudinally extending slot and at least one undercut longitudinal flange along one side of said slot, said connecting element comprising:

an elongate housing insertable into the recess at the one end face of the first sectional bar, said housing including two housing portions;

an elongate mounting element slidably disposed in said housing, said mounting element having an aperture at one end, a hook at an opposite end and a bent segment between said aperture and said hook, said hook protruding from said housing and being engageable with a rearwardly facing surface of the flange of the second sectional bar;

actuating means in said housing and engageable with said mounting element for shifting same in a longitudinal direction in said housing and for moving said hook in a transverse direction during a portion of a longitudinal stroke of said mounting element, said actuating means including a manipulable eccentric pin transversely and rotatably mounted in said housing and traversing said aperture and at least a portion of said bore, said actuating means further including an incline in said housing engageable by said bent segment of said mounting element during a longitudinal stroke thereof caused by rotation of said eccentric pin; and

means for inducing said mounting element to execute solely longitudinal motion during a terminal portion of an inwardly directed locking stroke bringing said hook into engagement with said rearwardly facing surface of said flange, said means for inducing including a compression spring in said housing, said spring engaging said mounting element on a side thereof opposite said incline and said hook.

4,690,583

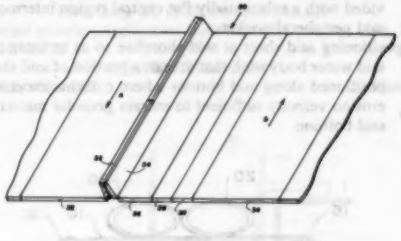
FLAT FOLDING ALTERNATING BARRIER

Harry A. Faulconer, 10405 Sierra Vista, La Mesa, Calif. 92041

Filed Apr. 8, 1986, Ser. No. 849,539

Int. Cl.[4] E01F *13/00*

U.S. Cl. 404—6 31 Claims



1. A barrier for dividing a roadway having a plurality of traffic lanes, comprising:

a plurality of slab-like roadway segments having adjacent sides thereof hingedly joined together; and

means for elevating at least two adjacent slab-like segments to form a dividing barrier for separating said traffic lanes in the general form of an inverted "V".

4,690,584

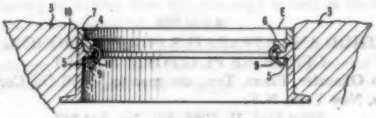
APPARATUS FOR SECURING ADJUSTABLE SUPPORT STRUCTURES FOR MANHOLE COVERS, GRATES AND THE LIKE

Francis LeBaron, East Bridgewater, Mass., assignor to E. L. LeBaron Foundry Co., Brockton, Mass.

Filed Apr. 17, 1985, Ser. No. 724,082

Int. Cl.[4] E02D *29/14*

U.S. Cl. 404—26 4 Claims



1. Apparatus for providing adjustable leveling of manhole covers, grates, and the like within ground and similar structures, having, in combination, an annular base ring provided with an internal ring seat and adapted to be secured within the ground or similar structure; an annular extension ring for supporting a cover, grate and the like at its upper edge and provided with a depending lower edge for engaging the said ring seat within the base ring; and the extension ring being provided with deformable bar means disposed inwardly of the extension ring near its said lower edge, said bar means extending lengthwise thereof substantially radially inwardly from an inner peripheral surface of the extension ring and being disposed such that said bar means may be bent over the ring seat of the said base ring securely to clinch the extension ring to the base ring.

4,690,585

EROSION CONTROL FOUNDATION MAT AND METHOD

Dick L. Holmberg, P.O. Box 100, Whitehall, Mich. 49461

Filed Jan. 17, 1985, Ser. No. 692,211

Int. Cl.[4] E02B *3/04*, *3/12*

U.S. Cl. 405—19 50 Claims

1. A method of restoring coastal shoreline of a water body having a surface, a bottom with granular material on said

bottom, and having erosion zones in which currents exceed an erosion velocity, comprising:

providing a generally flat water permeable geotextile sheet having peripheral edges;

forming peripheral pockets extending around said peripheral edges of said sheet and forming a plurality of spaced openings along said pockets such that said sheet is provided with a substantially flat central region intermediate said peripheral pockets;

positioning said sheet at said shoreline so as to extend into said water body such that at least a portion of said sheet is positioned along said bottom where currents exceed said erosion velocity sufficient to entrain granular material on said bottom;

filling said peripheral pockets with ballast material such that said peripheral pockets assume a downwardly oriented substantially vertical position in the granular material along said bottom;

providing a flexible stabilizer chamber separable from said sheet;

placing said stabilizer chamber on said substantially flat central region of said sheet with said peripheral pockets spaced from said stabilizer chamber and extending around said stabilizer chamber; and

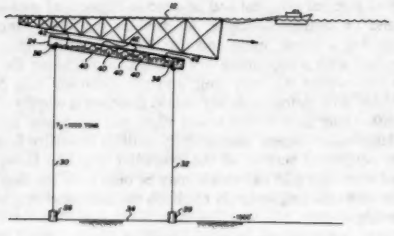
filling said stabilizer chamber with ballast material such that said stabilizer chamber extends upwardly in a low profile from said sheet into said currents, but at least a portion of said stabilizer chamber is disposed beneath said surface sufficient to permit water currents to pass over said stabilizer chamber.

4,690,586

METHOD AND APPARATUS FOR POSITIONING AN OFFSHORE PLATFORM JACKET

Yalcin Oksuzler, Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1985, Ser. No. 814,958
Int. Cl.[4] E02D *25/00*
U.S. Cl. 405—209 **2 Claims**



1. A method of positioning an offshore platform jacket comprising the steps of:

loading and securing the platform jacket onto a tension leg barge;

towing said tension leg barge to a predetermined offshore location;

laying anchors on the floor of the ocean at said predetermined offshore location;

attaching lines between said anchors and said tension leg barge to position and maintain said barge above said predetermined offshore location;

partially submerging said tension leg barge by shortening said lines between said anchors and said tension leg barge;

completing the submerging of said tension leg barge by flooding said barge with seawater; and

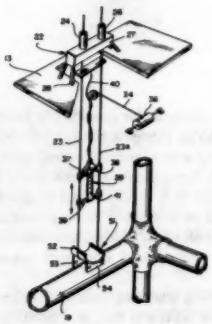
releasing said platform jacket from said tension leg barge and towing said jacket off said barge while said barge is submerged.

4,690,587

CORROSION DETECTION FOR MARINE STRUCTURE

Karl H. Petter, Metairie, and Gregory K. Robbins, Mandeville, both of La., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 21, 1985, Ser. No. 789,545
Int. Cl.[4] C23F *13/00*
U.S. Cl. 405—211 **9 Claims**



1. In a corrosion monitoring system for an offshore structure having a deck, an underwater deck supporting jacket formed of members which are subject to corrosion, said system including guide cable means (23–23*a*) which extend longitudinally of the jacket,

a carriage (29) detachably engaging said guide cable means and adapted to be slidably positioned along the latter,

signal generating corrosion sensing cell means (32) carried on said carriage (29) for communication with signal receiving means on said deck,

control means (34) engaging said carriage (29) for operably regulating the longitudinal position thereof along said guide cable means (23–23*a*),

said carriage (29) fabricated of a material capable of enclosing the corrosion sensing cell means (32) without interfering with the generation of signals by said cell means which reflect the corrosive condition of said jacket members, and comprising

an elongated body (31),

a plurality of lateral arms (37 and 38) extending outwardly from said elongated body (31) and including a contact shoe (42) at the remote end of said respective arms to removably engage said guide cable means (23, 23*a*), and

said shoe (42) having a wall including a slotted opening (46) formed therein, said opening being of sufficient width to register said guide cable means (23) therethrough.

4,690,588

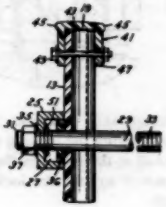
SEAWALL

Lawrence E. Berger, Sterling Heights, Mich., assignor to C-Lock Retention Systems, Inc., Utica, Mich.

Continuation of Ser. No. 607,313, May 4, 1984. This application Jun. 5, 1986, Ser. No. 873,443

Int. Cl.[4] E02D 29/02

U.S. Cl. 405—262 29 Claims



1. In a seawall along a body of water, extending along and retainingly and protectively bearing against a bounding shore with the seawall at its top extending above the ground level and at its bottom, retainingly projected down into the ground below the water bottom, the seawall comprising a series of laterally aligned enlongated corrugated bulkhead strips;

each bulkhead strip having along one side an undercut groove edge and along its other side, a similarly shaped tongue edge;

with the groove edges and tongue edges of adjacent bulkhead strips snugly interlocked;

the strips being made from a plastic material such that each strip may be lifted and assembled manually relative to an adjacent strip and driven into the ground into lateral alignment and longitudinal interlock with an adjacent strip;

a plurality of laterally spaced upright anchor strips inclined upwardly and away from said assembled bulkhead strips and embedded into the ground;

a series of flexible whalers spanning laterally across the face of said bulkhead strips adjacent said body of water, each of said whalers abutting an adjacent whaler in longitudinal alignment; and

a plurality of laterally spaced tie means protruding through said whalers interconnecting said bulkhead strips and said anchor strips, said whalers transferring and distributing the forces applied to said seawall along the surface of said bulkhead strips.

4,690,589

METHOD FOR FORMING A WATER-IMPERMEABLE LAYER IN A SOIL

Yutaka Owa, Chiba, Japan, assignor to Lion Corporation, Tokyo, Japan

Filed Apr. 28, 1986, Ser. No. 856,188

Claims priority, application Japan, Apr. 30, 1985, 60-92528

Int. Cl.[4] E02D 3/12

U.S. Cl. 405—263 2 Claims

1. In a method for forming a water-impermeable layer in a soil containing 10 meq or less of cations per 100 g of the dry soil by sprinkling an aqueous solution of a water-soluble polymer, which is convertible into a water-insoluble form by reacting with the ions in a soil, over a land so that the aqueous solution infiltrates the soil and the polymer is insolubilized by reacting with the ions in the soil, an improvement which comprises controlling the value of pH of the aqueous solution, in which the concentration of soluble salts does not exceed 0.2% by weight, in the range from 4 to 12 by adding an acid or alkali so that the water-impermeable layer is formed at a controlled depth in the range from 12 to 150 cm from the ground surface.

4,690,590

METHOD AND APPARATUS FOR POSITIONING DIAPHRAGMS IN VERTICAL SLOTTED WALLS WHICH ARE SUPPORTED BY A SUSPENSION

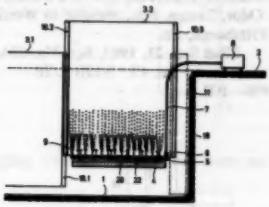
Manfred Nussbaumer, Leonberg; Eberhard Glüser, Aichwald, and Eberhard Beitinger, Stuttgart, all of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 22, 1985, Ser. No. 768,420

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430792

Int. Cl.[4] E02D 5/20

U.S. Cl. 405—267 22 Claims



1. An apparatus for positioning diaphragms in vertical slotted walls which are supported by a support suspension having a thixotropic structure, with respective diaphragm sections being lowered substantially centrally into the support suspension of the sealing wall mass; said apparatus comprises:

at least one air distributing device disposed at the bottom edge of said diaphragm section during the positioning process;

a supply line which connects said air distributing device to a source of compressed air to produce an upwardly directed flow of air bubbles for locally limited dissolution of the thixotropic structure of said support suspension and for reduction of specific weight of said support suspension having air bubble flow therethrough as well as for reduction of buoyancy lift force; and

a ballast weight connected to the bottom edge of said diaphragm section, with said air distributing device being connected to said ballast weight.

4,690,591

METHOD AND APPARATUS FOR TRANSPORTING AN ARTICLE IN VACUUM

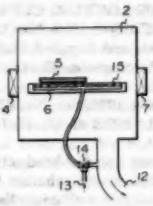
Masayasu Nagashima, Yokohama, and Nobuo Iijima, Tama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 27, 1983, Ser. No. 498,728

Claims priority, application Japan, May 28, 1982, 57-91629

Int. Cl.[4] B65G 51/03

U.S. Cl. 406—88 5 Claims



1. A method for transporting an article disposed on an upper surface of a stage, housed in an enclosed chamber, having a

plurality of inclined nozzles, said method comprising the steps of:

(a) reducing pressure of the enclosed chamber below atmospheric pressure;

(b) injecting a gas through the plurality of inclined nozzles formed in the stage housed in the enclosed chamber, while the pressure is maintained below atmospheric pressure, so that the article is transported in the direction of inclination of said inclined nozzles; and

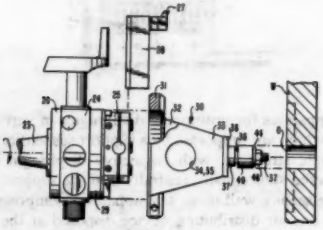
(c) treating the article by a chemical reaction with the gas used in said injecting step (b).

4,690,592

STABILIZING ATTACHMENT FOR BORING HEAD

Elbert P. Odor, Tampa, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 21, 1983, Ser. No. 534,238
Int. Cl.[4] B23B *3/26*
U.S. Cl. 408—1 R **15 Claims**



1. A stabilizing attachment for a boring head for machining an annular groove about an opening in a wall, the boring head having in axial alignment a driven shaft, a body stationary with respect to the wall and a rotatable head plate for supporting a tool holder and an orbiting bit, said attachment comprising:

(a) means for releasably engaging the rotatable head plate of the boring head,

(b) support means extending forwardly from said engaging means, said support means comprising at least two support arm means extending transversely from said engaging means and a transverse plate attached to the forward end of said support arm means, said arm means and plate providing a chamber for receiving said head plate, and said support arm means having an opening transversely thereof for passage therethrough of the tool holder carried by said rotatable head plate,

(c) a shaft carried by said support means axially thereof, and

(d) bearing means carried by said shaft having relatively rotatable parts, the relatively rotatable parts comprising an inner race and an outer race, the inner race being fixedly attached to said shaft and the outer race being adapted to engage the opening.

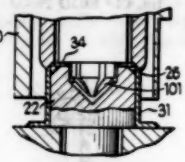
4,690,593

TOOL FOR CUTTING LOCKING CUPS FROM GUIDE TUBE MOUNTING SCREWS IN A NUCLEAR REACTOR

John D. Nee, Level Green, and Joseph J. Hahn, Whitehall, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 24, 1986, Ser. No. 822,182
Int. Cl.[4] B23B *41/00, 47/18*
U.S. Cl. 408—80 **20 Claims**

1. Apparatus for freeing a socket-head screw from a locking cup therefor in a reactor cavity, wherein the lcking cup includes a fixed cylindrical side wall encircling the side surface of the screw head and an annular end wall overlying the outer end surface of the screw head, said apparatus comprising: frame means, cylindrical cutter means having a longitudinal axis and having a frustoconical cutting surface with an inner diameter less than the inner diameter of the locking cup side wall and with an outer diameter greater than the outer diameter of the locking cup side wall, and drive means carried by said frame means and coupled to said cutter means for effecting



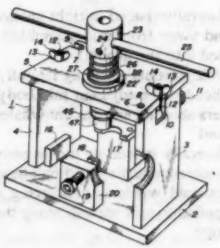
rotation thereof about said axis, said rotating cutter means being operable for severing the locking cup end wall from the locking cup side wall at the junction therebetween when said cutter means is moved against the locking cup substantially coaxially therewith.

4,690,594

DEBURRING APPARATUS

Minoru Kato, Kawasaki, Japan, assignor to Myotoku Ltd., Tokyo, Japan

Filed Jun. 5, 1985, Ser. No. 741,603
Claims priority, application Japan, Jun. 16, 1984, 59-89745[U]
Int. Cl.[4] B23B *27/02*
U.S. Cl. 408—159 **1 Claim**



1. A deburring apparatus for removing burrs which are formed at the intersecting inner edges of at least two intersecting bores of a workpiece, comprising: a frame having means for holding said workpiece; a cutter spindle borne rotatably in said frame in axial alignment with one of said bores; a cutter hinged to a leading end portion of said cutter spindle and biased to swing outwardly of the peripheral side thereof for cutting off the burrs at said intersecting inner edges of said intersecting bores of said workpiece held by said holding means of said frame when said cutter spindle is inserted into said one of said bores and is rotated; a guide sleeve fitted slidably on said cutter spindle for sheathing said cutter while said cutter spindle is being inserted into or retracted out of said one of said bores, and for exposing the edge of said cutter to the outside when in the deburring operation; and cam means for directing said cutter along a curve defined by said intersecting inner edges of said bores of said workpiece, said cam means comprising a member fixed on said frame and having a cam face profiling said curve defined by said inner edges, and a follower fixed on said cutter spindle and urged to come into contact with said cam face during said deburring operation.

4,690,595

DE-BURRING TOOL FOR THE DE-BURRING OF THE EDGES OF HOLES IN CURVED OR OBLIQUE SURFACES OF A WORK PIECE

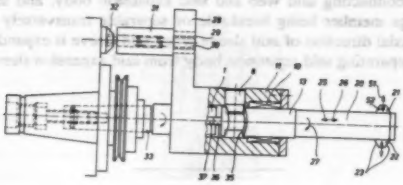
Heinrich Heule, Kristallstrasse 6, CH-9434 Au/TG, Switzerland

Filed Feb. 11, 1986, Ser. No. 828,634

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3505084

Int. Cl.[4] B23C *9/00*; B23B *51/16*

U.S. Cl. 409—143 1 Claim



1. A de-burring tool for the de-burring of hole edges (47–50), particularly those formed in curved or oblique work piece surfaces, and including a rotationally-driven tool holder (20) in which one or more cutters (21) (22) are arranged, and in which motion is controlled in an axial direction, characterized in that the tool holder (20) is axially and displaceably mounted in a fixed base body (11), in that the axial displacement of the tool holder (20) is achieved by a cam means (35) which follows the curvature of the edges (47–50) to be de-burred, said cam means being formed by an annular cam slot (38) which is cut into a cam body (13) which is connected to the tool holder (20), in that said cam means are engaged by follower means, the follower means including at least two trunnions (8) (17) which are adjustably connected to the base body (11) and mount rotatable bearing means on pins extended radially into the cam slot (38), achieving a form-locking fit of the trunnion (17) to the cam means (35), and in that on the centrally-mounted head of one of the trunnions (17) the pin (42) is arranged eccentrically to the trunnion's middle longitudinal axis, and the bearing means (9) are arranged on the pin (42), whereby rotary adjustment of said one of the trunnions (17) is effective to eliminate backlash between the cam means and the bearing means.

4,690,596

DEVICE FOR MAKING INSIDE GROOVES IN HOLLOW PARTS

Guy Mortier, Bonnetable, and Jean-Claude Chartrain, St-Aubin des Coudrais, both of France, assignors to Sourian & Cie., Boulogne, France

Filed Jun. 12, 1986, Ser. No. 873,382

Claims priority, application France, Jun. 18, 1985, 85 09203

Int. Cl.[4] B23C *5/26*

U.S. Cl. 409—143 7 Claims

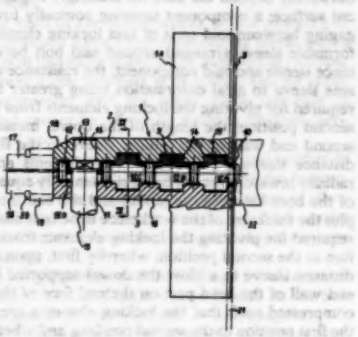
1. A device for making inside grooves in a hollow part, said device comprising:

an elongate body having a first end and a second end;

said body having an interior hollow extending from said first end to a side opening close to said second end;

said interior hollow containing a succession of intermeshing gearwheels including a first gearwheel mounted at said first end for engagement with a driving toothed wheel having a thickness larger than said first gearwheel, and a last gearwheel having fixing means facing said side opening and suitable for fixing a milling bit, said first end of said body being provided with mounting means for slidingly mounting said body on a slideway; and

said mounting means and said slideway extending parallel to teeth of said driving wheel and said first gearwheel whereby said device can be moved in said slideway without discharging said first gearwheel from said driving wheel.



4,690,597

POSITIVE ARRANGEMENT FOR FASTENING A DOWEL

Heinrich Liebig, Wormser Strasse 23, D-6102 Pfungstadt, Fed. Rep. of Germany

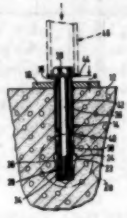
PCT No. PCT/EP84/00017, § 371 Date Aug. 6, 1984, § 102(e) Date Aug. 6, 1984, PCT Pub. No. WO84/03917, PCT Pub. Date Oct. 11, 1984

PCT Filed Jan. 20, 1984, Ser. No. 638,970

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312141

Int. Cl.[4] F16B *13/04*

U.S. Cl. 411—32 4 Claims



1. A fastening arrangement for fastening a workpiece, comprising: a dowel, and a sub-surface; said sub-surface having a cylindrical bore with a mouth at the sub-surface, an end face inside the bore at a distance from the mouth, and an undercut surface between the mouth and the end face and extending radially outwardly from the cylindrical bore; said dowel comprising: an elongated fastening bolt having a first end and a second and spaced from said first end; a bolt head or nut on said second end of said fastening bolt; a distance sleeve arranged around said fastening bolt and having a first end adjacent said bolt head or nut, and a second end remote therefrom; a tubular sleeve having: a circumferential wall with a wedge-shaped peripheral groove, a first end wall, a plurality of slots extending at substantially uniform angular spacing in said circumferential wall from said first end wall to said peripheral groove, thus dividing the tubular sleeve into a plurality of segmental sections, said segmental sections constituting locking elements, the tubular sleeve below said groove forming a head part approximately of the same diameter as the bore, said head part threadedly engaging said first end of said bolt and having a second end wall supported on said end face, the locking elements having ends projecting towards the distance

sleeve and being pivotable from a first, radially inward position within the diameter of the bore to a second, locking position in which said locking elements project at least partly radially outwardly beyond the bore for lockingly engaging the undercut surface; a component tapering conically towards and engaging between said ends of said locking elements, and a deformable sleeve arranged around said bolt between said distance sleeve and said component; the resistance of the deformable sleeve to axial deformation being greater than the force required for pivoting the locking elements from the first to the second position; the length of the dowel measured from the second end wall of the tubular sleeve to the first end of the distance sleeve, when the locking elements are in the first, radially inward position, being substantially equal to: the depth of the bore between the mouth and the end face of the bore, plus the thickness of the workpiece to be fastened, plus a length required for pivoting the locking elements from the first position to the second position; whereby first, upon subjecting the distance sleeve to a blow the dowel supported by the second end wall of the head part on the end face of the bore will be compressed such that the locking elements are pivoted from the first position to the second position; and whereby secondly, upon screwing the bolt head or nut further into the head part the deformable sleeve is deformed for fastening the workpiece to the sub-surface.

4,690,598

EXPANSION DOWEL

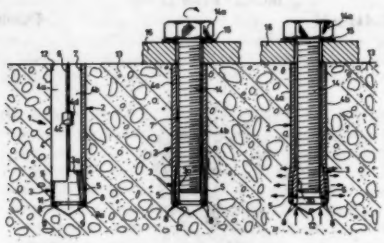
Armin Herb, Peissenberg, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft

Filed Jul. 8, 1985, Ser. No. 752,918

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1984, 3425239

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—40 **9 Claims**



1. An expansion dowel comprising an axially extending generally cylindrically shaped expansion sleeve having a leading end and a trailing end spaced apart in the axial direction of said expansion sleeve with the leading end being inserted first into a prepared borehole for the expansion dowel and a generally circularly shaped expansion body extending in the axial direction of said expansion sleeve and positioned within the leading end of said expansion sleeve and arranged to be pulled in the axial direction of and through said sleeve from the leading end toward the trailing end for radially expanding at least the leading end of said sleeve into contact with the borehole, said sleeve comprising an axially extending generally circularly shaped sleeve section extending from the trailing end toward and terminating short of said leading end of said sleeve, said sleeve section having a first end spacd from the leading end of said sleeve and a second end at the trailing end of said sleeve, said sleeve having at least one slit therein open at the first end of said sleeve section and extending from the first end toward the second end of said sleeve section, said expansion body having an axially extending inner surface and an axially extending outer surface with at least one recess in the outer surface thereof and extending generally in the axial direction of said sleeve, said sleeve including at least one web extending and elongated in the axial direction of said sleeve and extending from the first end of said sleeve section and forming the leading end of said sleeve, said sleeve section having a circumferential dimension and said web having a dimension in the circumferential direction of said generally circularly shaped sleeve section significantly smaller than the circumferential dimension of said sleeve section and said recess having a circumferential dimension substantially the same as the circumferential dimension of said web, said web being fitted into said recess in said expansion body, a bridge member located at the end of said web forming the leading end of said sleeve and interconnecting said web and said expansion body, and said bridge member being breakable or separable transversely of the axial direction of said sleeve when said sleeve is expanded for separating said expansion body from said expansion sleeve.

4,690,599

SELF-PIERCING NUT

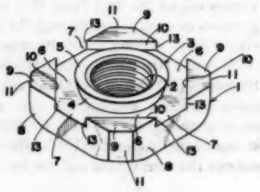
Katsumi Shinjo, Osaka, Japan, assignor to Yugen Kaisha Shinjoseisakusho, Osaka, Japan

Continuation of Ser. No. 646,468, Sep. 4, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 780,095

Claims priority, application Japan, Dec. 24, 1981, 56-212367

Int. Cl.[4] F16B *37/04*

U.S. Cl. 411—180 **4 Claims**



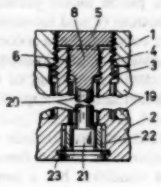
1. A self-piercing nut adapted to be fixed to a metal panel, the self-piercing nut comprising a substantially rectangular body portion, a centrally disposed threaded fastener accommodating hole extending through said body portion, a pilot means provided around said threaded fastener accommodating hole for punching a nut accommodating hole in the metal panel, said pilot means includes a circumferential side wall converging toward an upper surface of said body portion, and a punching face defining a periphery of the threaded fastener accommodating hole, an individual seat face means provided only at each corner of said body portion for supporting the metal panel, said seat face means including an upper surface having a substantially flat profile and a substantially vertically extending wall portion facing the circumferential wall portion of the pilot means and spaced therefrom, said wall portion of said seat face means extending perpendicular to a diagonal axis of the body portion, each of said wall portions of said seat face means intersects with sides of the body portions such that the said seat face means are provided with shoulder portions at respective intersections, and single recess means defined between adjacent seat face means for receiving extruded portions of the metal panel between the shoulder portions thereby preventing relative rotation between the self-piercing nut and the metal panel and ensuring a firm fastening of the self-piercing nut to the metal panel.

4,690,600

THREADED CONNECTION HAVING MULTI-PART THREADED BOLT

Fredy Lauer, Rickenbach-Attikon, Fed. Rep. of Germany, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 22, 1986, Ser. No. 866,212
Claims priority, application Switzerland, May 30, 1985, 02286/85
Int. Cl.[4] F16B *39/28, 39/22*
U.S. Cl. 411—263 6 Claims



1. A threaded connection comprising

a tapped component; and

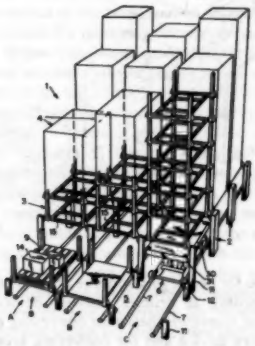
a bolt having a pair of externally threaded parts for threading into said tapped component, a screwthread threadably connecting said parts for relative rotation therebetween, one of said parts having a longitudinally disposed threaded bore and the other of said parts including a threaded extension threaded into said bore and having a torsion bar connected at one end to said one part at one end of said bore to permit relative movement between said parts whereby during threading of said bolt into said tapped component said parts move together to permit continuous threading and in response to unthreading of said bolt from said tapped component said parts move relative to each other to prevent removal of said bolt from said tapped component.

4,690,601

STORAGE ASSEMBLY AND METHOD OF USING SAME

Siegried Delius, and Doris Delius, both of Rothemsvägen 10, S-595 00 Mjölby, Sweden

Continuation of Ser. No. 97,752, Nov. 27, 1979, abandoned. This application Jan. 14, 1983, Ser. No. 458,073
Claims priority, application Sweden, Dec. 4, 1978, 7812441
Int. Cl.[4] B65G *57/30*
U.S. Cl. 414—96 8 Claims



5. A method of stacking load carriers in a storage assembly, said method comprising the steps of:

(a) providing a plurality of vertically stackable load carriers, pile bed means including vertically disposed uprights having support members fixedly attached to each upright for supporting said load carriers, and at least one carriage operative to move below a load carrier supported by the pile bed means,

(b) providing each of the load carriers with a plurality of vertically disposed posts interconnected by frame means with each post including upper guide members at its upper end and lower guide members at its bottom end for cooperative engagement with the upper guide members of another load carrier for vertically stacking the load carriers on top of each other,

(c) providing rest means attached on each load carrier to engage the support members for supporting the bottommost load carrier at an upwardly spaced distance to allow the disposition of the carriage carrying a load carrier underneath the bottommost load carrier support by the pile bed means,

(d) engaging the guide means of the carriage with the lower guide members of a load carrier to be loaded on the bottommost position of a selected pile of load carriers,

(e) moving the carriage with the engaged load carrier horizontally to a first position below the selected pile,

(f) moving the guide means of the carriage vertically upwardly so that the upper guide members of the load carrier positioned on the carriage cooperatively engage the lower guide members of the bottommost load carrier of the selected pile in order to raise the whole pile of load carriers thereabove,

(g) stopping the vertical movement of the guide means of the carriage at an intermediate position and moving the load carriers from the support members of the pile bed means so that the pile of load carriers is vertically movable without interference of the support members,

(h) moving the guide means of the carriage vertically upwardly further until the rest means of the load carrier positioned on the carriage have passed the support members of the pile bed means,

(i) moving the load carrier back to a position where the rest means of the load carriers are vertically aligned with the support members of the pile bed means, and

(j) moving the guide means of the carriage vertically downwardly until the rest means of the bottommost load carrier of the pile cooperatively engage the support members of the pile bed means for supporting the pile of load carriers, and releasing the carriage from the load carrier now loaded.

4,690,602

AUTOMATIC STORAGE AND RETRIEVAL SYSTEM

John Castaldi, Brooklyn, and Fred Greenzang, Huntington, both of N.Y., assignors to Applied Retrieval Technology, Inc., Hempstead, N.Y.

Filed Feb. 22, 1985, Ser. No. 704,552
Int. Cl.[4] B65G *1/02*
U.S. Cl. 414—282 9 Claims

1. A storage and retrieval system comprising:

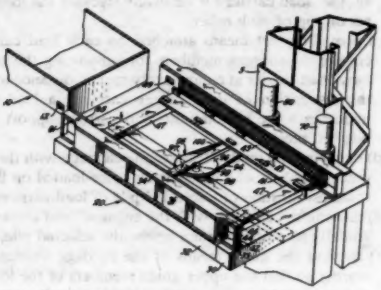
(a) a plurality of storage bins arranged in spaced fashion in a first two-dimensional array, each bin having a first pair of engageable means on each side wall near a first end of the bin and a second pair of engageable means on each side wall near the opposite end of the bin;

(b) means for extracting any selected bin from the array by engaging that pair of engageable means on the selected bin located nearest the front of the array, the extracting means including a frame and parallel arms spaced apart by a distance greater than the bin width, the arms being capable of joint movement with respect to the frame in a direction perpendicular to the plane of the array to a limit position where the arms extend part way along the sides of a selected bin, each arm having associated therewith bin engaging means capable of movement along the arm and having retractable means for engaging the engageable

means on any selected bin and thereby withdrawing that bin from the array and onto the frame;

(c) movable platform means for carrying the extracting means; and

(d) control means for causing the platform means to move horizontally and vertically to a position with respect to the array where the extracting means is adjacent the selected bin; for then directing the arms to move toward and



around the bin sufficiently to bring the retractable bin engaging means into alignment with the engageable means on the selected bin; for then causing the retractable bin engaging means to engage the bin; for then directing the extracting means to extract the selected bin from the array; and for then directing the platform means to move horizontally and vertically to another desired location with the selected bin.

4,690,603

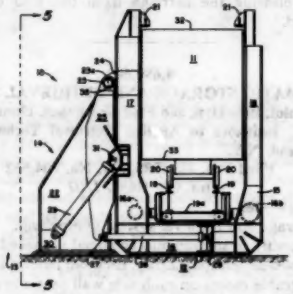
CAR DUMPING APPARATUS

Joseph R. Graner, Pittsburgh, Pa., assignor to Heyl & Patterson, Inc., Pittsburgh, Pa.

Filed Jul. 2, 1985, Ser. No. 751,232

Int. Cl.[4] B65G *67/00*

U.S. Cl. 414—372 **6 Claims**



1. Apparatus for dumping an open top railroad car comprising:

a railroad car damping site including: a parking area for said railroad car; a dumping area spaced from said parking area; and support means between said dumping area and said parking area; said support means defining a generally horizontal axis generally parallel to the lengthwise axis of said railroad car in said parking area; means for advancing a said railroad car into the said parking area;

frame means rigidly engageable with said railroad car, said fram means being connected to said support means for rotation movement about said horizontal axis;

an intermediate support member connected to said support means for rotation movement about said horizontal axis;

a first hydraulic piston motor pivotally connected at one end to said support means and pivotally connected at the other end to the said intermediate support member at the central portion thereof between the said first and second ends of said intermediate support member, whereby extension of said first hydraulic piston motor causes a rotation movement of the combination of said frame means and said railroad car and said intermediate member about said horizontal axis;

a second hydraulic piston motor pivotally connected at a first end to the bottom of said intermediate support member and pivotally connected at a second end to said frame means whereby extension of said second hydraulic piston motor causes rotation movement of the combination of said frame means and said open top railroad car about said horizontal axis;

wherein the said horizontal axis defines a vertical plane and wherein the combination of said frame and said railroad car in its loaded condition has a centroid which passes through the said vertical plane prior to completion of rotation movement of the said combination; and

wherein the said combination of said frame and said railroad car in an unloaded condition has its centroid positioned nearer to the base of said frame on the parking area side of the said vertical plane when the combination of said frame and said railroad car is in the maximum rotation position;

whereby the extendion of said first and said second hydraulic piston motors positions the said frame in a dumping position to a final position where the said railroad car is positioned above said support means with its open top facing said dumping area.

4,690,604

CONVEYING APPARATUS FOR ROD-LIKE ARTICLES

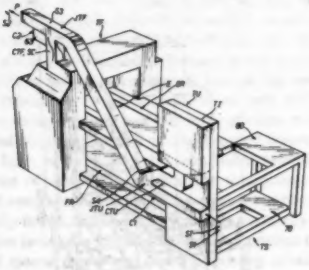
Simon G. Calverley, Heston Chapel; David C. M. Carter, Milton Keynes; Peter A. Clarke, London; John G. Dowding, Milton Keynes; David M. Hawkins, Milton Keynes, and Robert J. C. S. Mitchell, Milton Keynes, all of United Kingdom, assignors to Molins PLC, London, United Kingdom

Filed Jul. 6, 1984, Ser. No. 628,304

Claims priority, application United Kingdom, Jul. 6, 1983, 8318304

Int. Cl.[4] A24C *5/35*

U.S. Cl. 414—403 **33 Claims**



33. Apparatus for conveying rod-like articles of the tobacco industry, comprising an articles delivery device, an article receiving device, conveyor means for conveying articles away from the delivery device and for conveying articles towards the receiving device, said conveyor means being arranged to convey articles in multi-layer stack formation, a container loading means, a container unloading means, a first subsidiary conveyor linking the container loading means with said conveyor means at a first junction, a second subsidiary conveyor

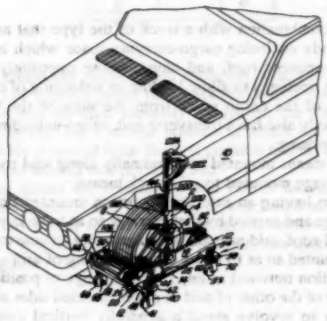
linking the container unloading means with said conveyor means at a second junction, and a container handling system including means for conveying a container between said loading means and said unloading means, wherein said first junction is upstream of said second junction relative to the direction of movement of articles on said conveyor means, and said unloading means is upstream of said loading means relative to said direction.

4,690,605

APPARATUS FOR JACKING AND DOLLYING AN AFFIXED VEHICLE WHEEL ASSEMBLY

Albert V. Coccaro, 9 Capricorn La., Bedford Hills, N.Y. 10507

Filed Aug. 30, 1985, Ser. No. 771,243
Int. Cl.[4] B62B *29/00*
U.S. Cl. 414—429 12 Claims



1. Apparatus that jacks and, thereafter, dollies a vehicle wheel assembly while the assembly is affixed to the vehicle, the assembly including a pneumatic tire, a wheel and an axle, the apparatus comprising:

structural means for constituting an apparatus framework, the framework including a body section having a first member and a second member, the first and second body section members being movable relative to one another, the framework also including a first arm member connected to the first body member, and a second arm member connected to the body section second member;

transport means for rendering the apparatus movable;

engaging means which are adjustable for interacting with the wheel assembly, the engaging means including a first element connected to the framework first arm member, and a second element connected to the framework second arm member, wherein at least one of the engaging means elements includes a roller assembly having means for adjusting the effective roller assembly radius; and

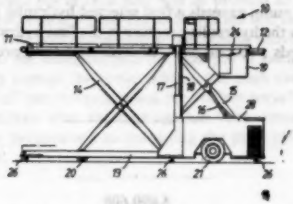
actuator means which is connected to the framework and which cooperates with the engaging means such that when the actuator means is activated, the engaging means elements are forced into contact with the pneumatic tire causing the tire to ride over the roller assembly of the engaging means and lift the wheel assembly while forming the framework into a carriage for receiving the wheel assembly, and which actuator means also cooperates with the engaging means to provide a mechanical advantage, for lifting the wheel assembly onto the carriage which may be varied by adjusting the effective roller assembly radius of the engaging means relative to the wheel assembly.

4,690,606

MOBILE LOADERS

Christopher P. Ross, West Drayton, England, assignor to Ipeco Europe Limited, Essex, England

PCT No. PCT/GB85/00121, § 371 Date Nov. 4, 1985, § 102(e) Date Nov. 4, 1985, PCT Pub. No. WO85/04387, PCT Pub. Date Oct. 10, 1985
PCT Filed Mar. 28, 1985, Ser. No. 798,688
Claims priority, application United Kingdom, Mar. 30, 1984, 8408346
Int. Cl.[4] H02J *7/00*; B60P *1/44*
U.S. Cl. 414—495 6 Claims



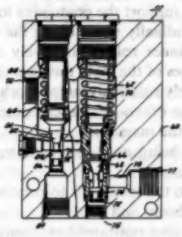
2. Apparatus for raising and/or lowering of loads, said apparatus comprising a chassis having a variable height platform, said platform being connected to said chassis by means for maintaining said platform in a substantially level attitude irrespective of said platform height, mechanical lifting means for varying the height of the platform with respect to said chassis, electric motor drive means connected by transmission means to said mechanical lifting means for raising said platform, electrical energy storage means for powering said electric motor drive means, control means whereby the electric motor drive means may be switched to function as electrical generator means to provide retardation of said platform when being lowered, and means to direct electrical energy generated during lowering of said platform into said electrical energy storage means.

4,690,607

REFUSE COLLECTION TRUCK AND APPARATUS FOR CONTROLLING COMPACTION OF REFUSE

Gary Johnson, Fort Payne, Ala., assignor to The Heil Co., Milwaukee, Wis.

Filed Oct. 4, 1985, Ser. No. 784,846
Int. Cl.[4] B65F *3/28*
U.S. Cl. 414—517 12 Claims



1. Apparatus for use in a refuse collection container having a forward end and an open rearward end, a refuse packing plate supported adjacent said rearward end of the container for forcing refuse material into the container, a first hydraulic cylinder for causing movement of the refuse packing plate between a retracted position and a refuse compacting position, an ejector panel housed in the container and being movable between a forward end of the container and the open rearward

end of the container, and a second hydraulic cylinder connected to the ejector panel, the second hydraulic cylinder being extendable to cause movement of the ejector panel toward the open end and being retractable, the apparatus comprising:

a hydraulic fluid operably connected to the first hydraulic cylinder and to the second hydraulic cylinder,

a control valve for controlling the supply of hydraulic fluid to the second hydraulic cylinder,

means for selectively releasing hydraulic fluid from the second hydraulic cylinder to permit movement of the ejector panel toward the forward end of the container only when both the hydraulic pressure at the hydraulic fluid pump exceeds a first selected hydraulic pressure and when the hydraulic pressure in the first hydraulic cylinder exceeds a second selected hydraulic fluid pressure.

4,690,608

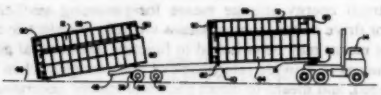
TRAILER FOR TRANSPORTING LARGE CONTAINERS

Robert Rasmussen, Berlin, N.J., assignor to Accurate Industries, Inc., Williamstown, N.J.

Division of Ser. No. 468,319, Feb. 22, 1983, Pat. No. 4,599,040. This application Dec. 9, 1985, Ser. No. 806,907

Int. Cl.[4] B60P *1/48*

U.S. Cl. 414—529 **1 Claim**



1. A trailer for transporting simultaneously two nested pluralities of containers over a road surface comprising

a pair of laterally spaced main rails extending the entire length of the trailer, the main rails each terminating upwardly in a planar top surface;

each main rail comprising an inner facing surface and an outer facing surface;

a plurality of cross members connected between the main rails and spacing the main rails apart;

a plurality of outer rollers rotatively carried at the outer facing surfaces of the main rails near the said top surfaces to rotatively support the containers to permit the containers to longitudinally move along the main rails;

a plurality of inner rollers rotatively carried at the inner facing surfaces of the main rails near the said top surfaces to alternatively rotatively support others of the containers to permit the others of the containers to longitudinally move along the main rails;

the trailer not being equipped with any type of container lifting mechanism;

axles secured to the main rails to rotatively support left and right rear wheels; and

an unloading ramp positioned rearwardly of the axles and rearwardly extending integrally from the main rails, the unloading ramp downwardly declining from the said planar top surfaces, the unloading ramp declining at an angle of approximately fifteen degrees from the planar top surfaces, the unloading ramp terminating at least about fifteen inches above the said road surface and not more than about twenty-one inches above the road surface, whereby the containers are unloaded by backing and quickly stopping the trailer.

4,690,609

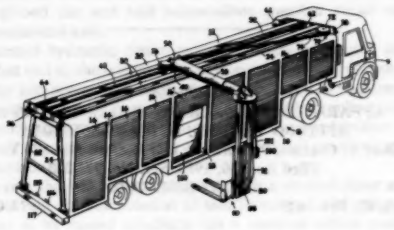
TRUCK LOADING APPARATUS

James M. Brown, 1637 Deer Valley Rd., Crown Point, Ind. 46307

Continuation of Ser. No. 727,528, Apr. 25, 1985, abandoned. This application Sep. 17, 1986, Ser. No. 908,314

Int. Cl.[4] B60P *1/64, 1/00*

U.S. Cl. 414—543 **11 Claims**



1. In combination with a truck of the type that as an elongated body enclosing cargo-carrying space which is covered by a permanent roof, and along whose oppositely directed sides are openings to allow loading or unloading of cargo into and out of the cargo space from the sides of the body and which body also has a transverse end, cargo-unloading apparatus comprising:

track means mounted longitudinally along said roof;

a carriage mounted to said track means;

an arm having an extendable portion mounted on said carriage and carried by that carriage so as to be moved along said roof, said arm and carriage being so constructed and mounted so as to allow the positioning of said extendable portion outward of any one of a range of positions along one of the other of said opposite directed sides and for the arm to revolve about a generally vertical axis so as to move said extendable end about one transverse end of the truck body;

projecting means which may releasably engage cargo for lifting and carrying the cargo;

powered and controlled depending means connected to said extendable portion of said arm and mounting said projecting engaging means;

said powered and controlled means and said arm being controllable so as to move said projecting members deep into the cargo space under the roof at any number of different locations along the side of the body, through an opening therein, for lifting cargo therefrom and carrying it out and depositing it adjacent to the truck; and

whereas said extendable portion and said depending means may be swung from one oppositely directed side of said body to the other oppositely directed side about a transverse end of said body, without the need to remove or raise said depending means, so it may serve to unload or load from either side.

4,690,610

LIFT MAST TRANSPORT ARRANGEMENT

James R. Fotheringham, Willowick, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Apr. 24, 1986, Ser. No. 855,866

Int. Cl.[4] B66F *17/00*

U.S. Cl. 414—631 **20 Claims**

1. A material handling vehicle, comprising:

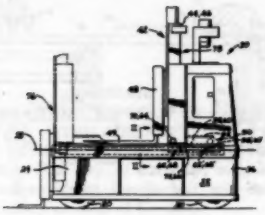
a frame having first and second spaced apart end portions, and a longitudinal vehicle axis extending between said first and second end portions;

a first guide rail connected to said frame, said first guide rail being substantially parallel to said longitudinal vehicle axis;

a second guide rail connected to said frame at a location spaced from said first guide rail, said second guide rail being substantially parallel to the first guide rail;

a lift mast assembly having a pair of spaced apart upright guide members, and a carriage assembly connected to and elevationally movable along said upright guide members;

transport means for connecting said lift mast assembly to said first and second guide rails and guiding movement of said lift mast assembly along said first and second guide rails in directions substantially parallel to said longitudinal vehicle axis;



power means for moving said transport means along said first and second guide rails between a first position at which said lift mast assembly is adjacent the frame first end portion, and a second position at which the lift mast assembly is spaced from the first position and between the first and second end portions; and

coupling means for connecting said power means to said transport means and providing a preselected amount of free movement of the transport means relative to said power means in directions transverse to the first and second guide rails.

4,690,611

AUTOMATIC TRANSFER APPARATUS FOR ELEVATORS

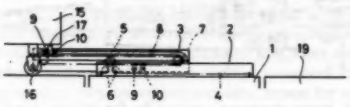
Uichi Nobuhara, Kishiwada, Japan, assignor to Kabushiki Kaisha Kumalift Gijutsu Kenkyusho, Osaka, Japan

Filed Nov. 19, 1985, Ser. No. 799,734

Claims priority, application Japan, Dec. 3, 1984, 59-184551[U]

Int. Cl.[4] B65G *65/00*

U.S. Cl. 414—661 **3 Claims**



1. An automatic transfer apparatus for loading and unloading a push car into and out of an elevator, comprising:

a guide means fixedly mounted on the floor of the elevator;

a carriage mounted in said guide means so as to be movable in a direction on and off the elevator while being guided by said guide means;

a first conveyor means in said guide means and connected to said carriage for reciprocally moving said carriage along said guide means;

a first drive means connected to said first conveyor means;

a second conveyor means on said carriage and having an endless travelling member for conveying a push car into and out of the elevator;

a second drive means connected to said second conveyor means for driving said second conveyor means; and

a plurality of pairs of pins secured to said endless travelling member, the pins in each pair being spaced in the direction of movement of said endless travelling member and each pin being pivotable only from a first position in which the pin projects transversely of the direction of travel of said endless travelling member to a second position in which the pin is out of said projected position and being pivotable back to said first position, the pivotal movement of the pins in each pair which is in the direction from the first to the second position being pivotal movement toward the other pin of the pair,

whereby when the carriage member is in a position where it has been moved off the elevator by said first conveyor means, and said endless travelling member is driven to move the endless travelling member toward the elevator, the forward pin in each pair will be pivoted so as to pass a projection on the push car to be loaded and the rear pin in each pair will engage the projection to move the push car onto the elevator, and the rear pin in each pair will similarly engage the projection on the push car to move the car off the elevator when the endless travelling member is driven after the carriage has been moved off the elevator preparatory to unloading the push car from the elevator.

4,690,612

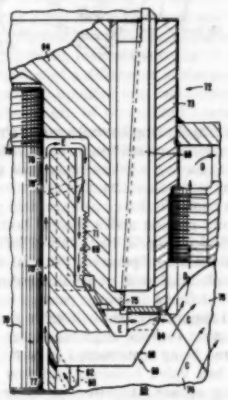
NUCLEAR REACTOR COOLANT PUMP IMPELLER/SHAFT ASSEMBLY

Leonard S. Jenkins, Plum Borough, Pa., assignor to Westinghouse Electric Corp, Pittsburgh, Pa.

Filed Aug. 1, 1985, Ser. No. 761,447

Int. Cl.[4] F01D *11/00*; G21C *15/00*

U.S. Cl. 415—112 **8 Claims**



1. A pump, comprising:

(a) a casing having an inlet and an outlet in fluid communication for circulating fluid coolant through the pump;

(b) a shaft positioned in the casing;

(c) an impeller nut connected to the shaft;

(d) a lockbolt fixedly connecting the impeller nut relative to the shaft;

(e) passageway means with first and second ends for directing fluid from the lockbolt to the shaft;

(f) first conduit means formed in the impeller nut in fluid communication with the first end of the passageway means and the inlet of the casing; and

(g) second conduit means formed in the impeller nut in fluid communication with the second end of the passageway means and the outlet of the casing,

wherein a portion of the fluid coolant circulating through the inlet of the casing is pumped through the first conduit means, through the passageway means, out the second conduit means and into the outlet of the casing.

4,690,613

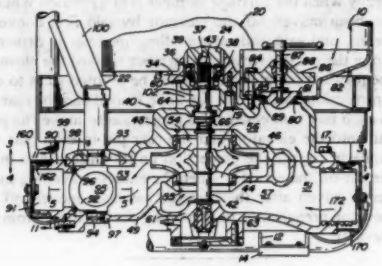
PORTABLE ENGINE-PUMP ASSEMBLY

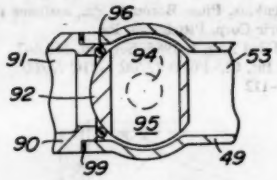
H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Continuation of Ser. No. 707,736, Mar. 4, 1985, Pat. No. 4,643,652. This application Jul. 18, 1986, Ser. No. 886,988

Int. Cl.[4] F04D *29/40*

U.S. Cl. 415—148 6 Claims





1. In a centrifugal pump having a pump shaft and an impeller mounted for rotation on said pump shaft within a volute chamber, said pump having a pump body split into two separable pieces defining said volute chamber and providing a pump inlet passage and a pump discharge passage, said pump body including a first body portion and a second body portion, the improvement comprising a ball valve for controlling flow through said discharge passage, the said first body portion forming one piece of said two piece pump body and being constructed to define a discharge passage having a housing for receiving and supporting said ball valve therein, and said second body portion forming the other piece of said two piece pump body and being constructed to provide a cover portion closing said ball valve housing, said first and second body portions being secured together at mating faces extending around said impeller.

4,690,614

TORQUE METER

Reginald G. Keetley, Daphne, Ala., and Keith Allen, Hollingworth Via Hyde, England, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Nov. 4, 1985, Ser. No. 794,651

Int. Cl.[4] B64C *11/38*

U.S. Cl. 416—43 10 Claims

1. In an aircraft engine including a torque-experiencing rotating lay shaft, a propeller, and means connecting said propeller to said shaft for driving said propeller, a lay shaft torque meter comprising:

a forward lay shaft end;

a housing;

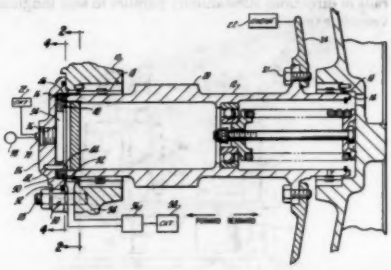
means for rotatably mounting said lay shaft in said housing;

means for applying a force to said lay shaft, said force being proportional to the torque experienced by said lay shaft, for axially moving said lay shaft in said housing between a forward lay shaft position and a rearward lay shaft position;

a body secured to said housing adjacent said forward end of said lay shaft and defining a chamber open to said forward end of said lay shaft;

a piston slidably mounted in said body abuttable against said forward end of said lay shaft;

means for pressurizing said chamber;



means for applying a force to said piston, said force being proportional to the pressure in said chamber, for urging said piston against said forward end of said lay shaft;

means for venting the pressure from said chamber when said lay shaft moves from said forward lay shaft position and towards said rearward lay shaft position; and

means for measuring the pressure in said chamber.

4,690,615

ROTOR, ESPECIALLY FOR ROTARY WING AIRCRAFT

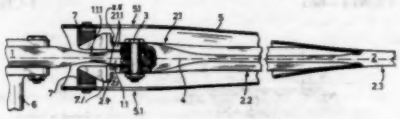
Gerald Kuntze-Fechner, Bad Wiessee; Otmar Friedberger, Neubiberg, and Michael Hahn, Ottobrunn, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 903,024

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1985, 3534968

Int. Cl.[4] B64C *27/33*

U.S. Cl. 416—134 A 10 Claims



1. A rotor structure, especially for rotary wing aircraft, comprising rotor blade means having a blade pitch axis and defining a rotation plane in which said rotor blade means rotate,a rotor hub having a rotational axis, said rotation plane extending substantially perpendicularly to said rotational axis, torsionally rigid rotor hub arm means projecting radially outwardly from said rotor hub, first means for connecting said rotor blade means to said rotor hub arm means, said rotor blade means comprising a blade root, a blade wing section, and a torsionally yielding blade neck arranged between said blade root and said blade wing section, said blade neck having a given first bending flexibility relative to blade flapping bending movements, torsionally rigid blade angle control sleeve means having a radially outer end and a radially inner end and extending without contact substantially coaxially along said blade neck, second means for movably connecting said radially inner end of said blade angle control sleeve to said blade root, and third means for rigidly connecting said radially outer end of said blade control sleeve to said blade wing section, said rotor

hub arm means comprising a flattened section (1.1.1) having a second bending flexibility which is larger than said given first bending flexibility so that said blade flattened section is softer relative to blade flapping than said neck, said flattened section (1.1.1) comprising a cross-sectional profile which is flat in a direction substantially perpendicularly to said rotation plane, said first means for connecting said rotor blade means to said rotor hub arm means comprising fork means forming part of said blade root and further means for connecting said fork means to said rotor hub arm means, and wherein said second means for movably connecting said radially inner end of said blade angle control sleeve to said blade root are connected to said fork means.

4,690,616

ROTOR STRUCTURE, ESPECIALLY FOR ROTARY WING AIRCRAFT

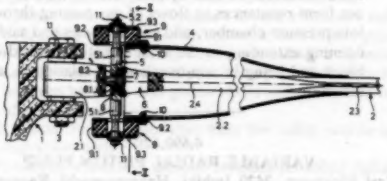
Michael Hahn, Ottobrunn, and Gerald Kuntze-Fechner, Bad Wiessee, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 884,961

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526470

Int. Cl.[4] B64C *27/35*

U.S. Cl. 416—134 A **5 Claims**



1. A rotor structure, especially for rotary wing aircraft, comprising a rotor hub and one or more rotor blades, each blade having a blade root, a blade neck, a blade wing section, and a blade pitch angle control sleeve, said blade neck being torsionally yielding for allowing a blade pitch angle adjustment movement, said blade neck being arranged between said blade root and said blade wing section, means connecting each rotor blade root to said rotor hub, said control sleeve being torsionally stiff for transmitting blade pitch angle adjustment forces to said wing section, said control sleeve extending essentially coaxially along but without contacting said blade neck to one end where said control sleeve is rigidly connected to said blade wing section, two-armed support strut means for securing an opposite end of said control sleeve to said blade root in a longitudinally slidable and rotatable manner relative to said blade root, said support strut means comprising bearing means for connecting said support strut means to said blade root in an articulated and slidable manner, said bearing means of said strut means being located in a hole in said blade root, said rotor structure further comprising damping means arranged above and below of said blade root outside said blade control sleeve, said damping means comprising at least an outer and an inner stiff cover layer and at least one damping elastomeric layer arranged between said inner and outer cover layers, said layers being arranged parallel to a lead-lag plane of said rotor blades, said damping means simultaneously forming a connection between said blade control sleeve and a respective strut arm of said two-armed support strut means, said strut arms,formed as threaded bolts, projecting from said damping means, and a nut for each threaded bolt strut for compressing the respective elastomeric layer.

4,690,617

METAL-CERAMIC COMPOSITE ARTICLE AND A METHOD OF PRODUCING THE SAME

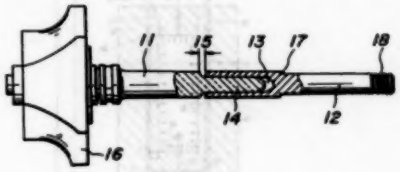
Isao Oda, Nagoya, and Nobuo Tsuno, Kasugai, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Aug. 16, 1984, Ser. No. 641,339

Claims priority, application Japan, Aug. 31, 1983, 58-158070

Int. Cl.[4] F01D *5/28*

U.S. Cl. 416—241 B **17 Claims**



1. A metal-ceramic composite article, comprising:

a metallic member having a first thermal expansion and having a first end and a second end and a hole extending from said first end toward said second end, said hole having an inner peripheral surface; and

a ceramic member having a second thermal expansion and having a first portion and a second portion, said second portion being a projection extending from said first portion, said projection having an outer peripheral surface which is in press-fitted contact with said inner peripheral surface of said hole throughut substantially its entire length, such that a gap is formed between said first portion of said ceramic member and said first end of said metallic member, said gap being formed such that it is greater in size than the product of a difference in thermal expansion between said metallic member and said ceramic member, multiplied by the length of press-fitted contact between the outer peripheral surface of the projection and the inner peripheral surface of said hole, multiplied by a maximum operating temperature of the composite article.

4,690,618

BOOSTER TYPE HIGH-PRESSURE VESSEL

Makoto Akatsu, and Keiichi Hori, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1985, Ser. No. 780,681

Claims priority, application Japan, Oct. 1, 1984, 59-204155

Int. Cl.[4] F04F *7/02*

U.S. Cl. 417—226 **4 Claims**

1. A booster type high-pressure vessel apparatus for increasing the pressure of a liquid medium to pressure treat a work piece, said apparatus comprising:

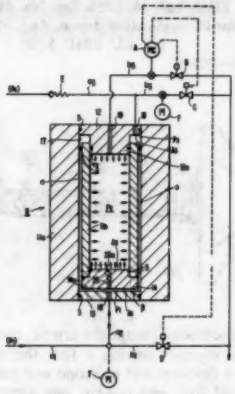
an outer cylinder having an upper lid at one end of said outer cylinder and a lower lid at the other end of said outer cylinder;

an inner cylinder slidably mounted within said outer cylinder, said inner cylinder having an outer diameter that is less than the inner diameter of said outer cylinder such that a clearance gap is defined between the outer cylindrical surface of said inner cylinder and the inner cylindrical surface of said outer cylinder;

a piston covering the end of said inner cylinder that is adjacent said lower lid, a pressure chamber in which the liquid medium is disposed being defined within said inner cylinder between said piston and said upper lid, and a booster chamber defined between said piston and said lower lid, said booster chamber open to and communicating with said clearance gap; and

a hydraulic circuit means for injecting pressurized fluid into said booster chamber and said clearance gap open thereto

for causing said inner cylinder to slide within said outer cylinder thereby pressurizing the liquid medium within the pressure chamber, said pressurized fluid in said clear-



ance gap creating a first pressure acting on said inner cylinder therearound that opposes the pressure acting on said inner cylinder therein created by the liquid medium when it is pressurized.

4,690,619

COMPRESSOR HAVING PULSATING REDUCING MECHANISM

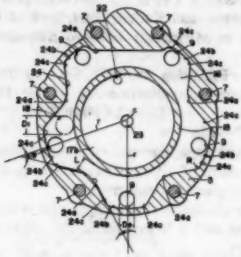
Takeo Iijima; Hiroshi Nomura; Susumu Saito, and Susumu Echizen, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 837,285

Claims priority, application Japan, Mar. 12, 1985, 60-48799[U]

Int. Cl.[4] F04B *1/18, 39/00*

U.S. Cl. 417—269 **4 Claims**



1. A compressor having a pulsating reducing means, said compressor comprising:

a cylinder block having a plurality of cylinder bores therein;

a plurality of pistons slidable in said cylinder bores;

means connected to said pistons for driving said pistons with a predetermined phase difference between the strokes of the respective pistons;

a valve plate on one end of said cylinder block and having a plurality of sets of at least one suction hole and at least one discharge hole, one set being positioned over the end of each of said cylinder bores;

a suction valve in each suction hole for opening and closing said suction hole;

a discharge valve in each discharge hole for opening and closing said discharge hole;

a hollow cylinder head on said one end of said cylinder block over said valve plate, said cylinder head having an end wall and a depending peripheral wall; and

a plurality of connecting bolts fixing the cylinder head and the valve plate to said cylinder block;

said cylinder head having a peripheral wall depending from an end wall and a bulkhead within said peripheral wall also depending from said end wall for partitioning the interior of said cylinder head into a high pressure chamber in the center of the interior and a low pressure chamber around the periphery of the interior, said end wall having a suction opening and a discharge opening therein, said high pressure chamber having said discharge holes opening thereinto and said discharge opening opening out therefrom, said low pressure chamber having said suction holes opening out therefrom and having said suction opening opening thereinto, and the inner surface of the peripheral wall of said cylinder head forming the outer wall of said low pressure chamber having a plurality of enlarged thickness sections around the respective connecting bolts, each of said sections having an inwardly convex surface portion, and said inner surface having a plurality of concave portions extending around the outer portions of the peripheries of said suction holes, and said inner surface having smoothly curved connecting portions connecting said convex portions and said concave portions, all points of which connecting portions are at an inwardly acute angle to a radius through the adjacent suction holes and the central axis of said cylinder block, whereby they do not form resistances to flows of gas passing through said low pressure chamber, said suction holes and said suction opening extending in the axial direction of said cylinder block and being in non-overlapping relation in said axial direction.

4,690,620

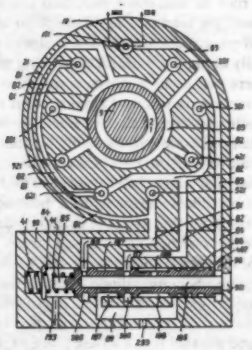
VARIABLE RADIAL PISTON PUMP

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 429,746, Sep. 30, 1982, abandoned, which is a division of Ser. No. 179,420, Aug. 19, 1980, Pat. No. 4,475,870. This application Mar. 20, 1985, Ser. No. 714,225

Int. Cl.[4] F04B *27/04*

U.S. Cl. 417—273 **5 Claims**



1. A hydraulic arrangement, comprising, in combination, a high pressure pump arranged in a housing and a valve body reciprocably arranged in a valve housing portion,

wherein said pump is provided with a plurality of working chamber groups with pluralities of individual pistons in

individual working chambers of the respective working chamber group while every working chamber group combines the delivery passages of its individual working chambers to a respective common delivery passage of the respective working chamber group,

wherein said valve housing portion is provided with a plurality of inlets equal to the number of said common delivery passages with said inlets axially distanced from each other relative to the axis of said valve body while each individual common delivery passage of said common delivery passages is individually and separately communicated to a single inlet of said inlets of said valve housing portion,

wherein said valve housing portion is provided with a high pressure delivery exit port and unloading passage means communicated to a space of substantially low pressure while said valve body is subjected to pressure in fluid on one of its axial ends by the rate of pressure of fluid in said high pressure delivery exit port and on its other axial end to a thrusting compressible spring which thrusts with its spring force again said other axial end of said valve body;

wherein said valve housing portion and said valve body are provided with passages and recesses to communicate and discommunicate said individual delivery passages of said chamber groups and said inlets individually and in common at different rates of pressure of said rate of pressure in said high pressure delivery exit port to said high pressure delivery exit port with stepwise variation of the number of inlets and common delivery flows of said inlets and said common delivery passages in dependency of said rate of pressure in said exit port; and an improvement;

wherein said improvement provides in combination;

(a) piston shoes between pistons in said chambers and a cylindrical outer face of an eccentric cam in said pump;

(b) fluid pressure pockets with surrounding and sealing sealing lands around said pockets to provide hydrostatic bearings between said piston shoes and said outer face of said cam;

(c) annular recesses provided from the radial outside into said valve body;

(d) radially extending annular recesses provided radially into said valve housing portion,

(e) an axially entending passage through a portion of said valve body,

(f) radial bores to individually communicate said annular recesses of said valve body with said axially extending passage; and

(g) axially extended annular control recesses provided on said valve body to alternately remain distanced from said radially extending annular recesses and to communicate at least one of said radially extending annular recesses with said unloading passage means;

whereby

(a) said radially extending recesses surround that valve body radially to prevent radially directed the valve body laterally displacing and thrusting forces;

(b) said annular recesses of said valve body temporarily register with respective recesses of said radially extending recesses of said valve housing portion for said communication and discommunication of said individually combined flows of fluid of said individaul chambers of said chamber groups, and;

(c) said axially extending passage of said valve body prevents valve body dislocating radial forces,

whereby said annular recesses of said housing portion and of said valve body together with said axially extending passage secure the easy reciprocation of said valve body in said housing portion without radially laterally directed forces respective to the axis of said valve body,

while said fluid pressure pockets between said piston shoes and said cam secure the capability to deliver fluid under pressure which exceeds three thousand pounds per square inch;

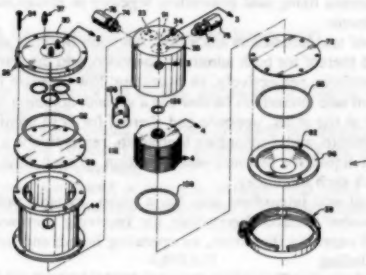
whereby said pump and said valve body in said valve housing portion secure the delivery of rates of pressure which exceed three thousand pounds per square inch through said exit port at different rates of flow which exceed three thousand pounds per square inch when said valve body reciprocates in said valve housing portion and thereby communicates and discommunicates a respective number of said annular recesses of said valve body with a respective number of said radially extending annular recesses of said valve housing portion.

4,690,621

FILTER PUMP HEAD ASSEMBLY

Danny C. Swain, San Jose, Calif., assignor to Advanced Control Engineering, Santa Clara, Calif.

Filed Apr. 15, 1986, Ser. No. 852,221
Int. Cl.[4] F04B *43/02*
U.S. Cl. 417—313 **20 Claims**



1. A filter pump head assembly, comprising:

an exterior frame member including an upper cap, a central barrel portion, and a lower cap and further including means for fastening said portions together to form an enclosed volume;

liner means adapted to fit within said barrel portion, the liner means including a control block portion adapted to be situated at the end of said barrel portion near said upper cap, said control block portion having paired apertures formed therein to permit fluid flow therethrough, and a hollow cylindrical portion extending from said solid portion and abuting against the interior of said barrel portion throughout the remainder of its extent;

filter means adapted to fit within said hollow portion such that all fluid flowing completely through the assembly must pass through the filter means;

first membrane means for blocking and unblocking said apertures in said control block portion to permit fluid flow therethrough; and

second membrane means adapted to alter the effective volume of said hollow portion;

first pneumatic means for selectively deforming said first membrane means;

second pneumatic means for selectively deforming said second membrane means; and

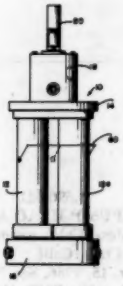
sealing means to restrain fluid to positions intermediate said first membrane means and said second membrane means.

4,690,622

LIQUID INTENSIFIER UNIT

Robert W. Decker, Stewartsville, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 776,463, Sep. 16, 1985, Pat. No. 4,621,988. This application Aug. 7, 1986, Ser. No. 893,952
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[4] F04B 35/02
U.S. Cl. 417—342 3 Claims



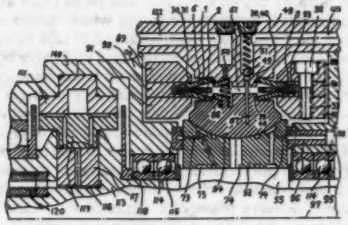
1. A liquid intensifier unit, comprising:
a plurality of elongate, liquid intensifiers; and
first means fixing said intensifiers together in juxtaposition; wherein
each of said intensifiers has a first, common opening at one end thereof for both admitting thereinto, and discharging therefrom, respectively, an operating, low-pressure fluid;
each of said intensifiers further has a second, common opening at the other, opposite end thereof for both admitting thereinto, and discharging therefrom, respectively, a subject liquid for pressure intensification of such liquid by such each intensifier;
each of said intensifiers also has a given, variable volume chamber formed therewithin for receiving therewithin, and expelling therefrom, an operating liquid; and further including
second means effecting a common, fluid communication of said given, variable-volume chambers only with each other, for conducting operating liquid, expelled from such a given, variable-volume chamber of one of said intensifiers, to said given, variable-volume chamber of another of said intensifiers; and
valving means, coupled to said intensifiers for admitting an operating, low-pressure fluid to, and for discharging the same, said, low-pressure fluid from, said first, common opening of each of said intensifiers, in turn, and repetitively; wherein
each of said intensifiers further has a low-pressure piston therewithin movable in first and second, opposite directions;
said valving means and said second means comprise means cooperative for moving one of said low-pressure pistons, in one of said intensifiers, in one of said first and second directions, at a given acceleration in response to a movement of another low-pressure piston, in another of said intensifiers, in the other of said first and second directions, at a differing acceleration;
said first means comprises a base plate;
said base plate has a given plurality of channels formed therein;
each of said channels has a pair of ports, formed in, and opening externally of, said plate, in communication therewith;
an aperture formed in said plate, and opening both externally and internally of said plate; and
ends of each of said channels are in fluid-flow communication with said aperture.

4,690,623

FLUID PUMPS, FLUID MOTORS AND DEVICES, WHICH INCLUDE A CONED RING

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-Ken, Japan

Division of Ser. No. 282,990, Jul. 14, 1981, Pat. No. 4,557,347, which is a continuation of Ser. No. 910,809, May 30, 1978, abandoned, and a continuation-in-part of Ser. No. 911,246, May 31, 1978, abandoned, and a continuation-in-part of Ser. No. 224,769, Jan. 13, 1981, abandoned. This application Dec. 9, 1985, Ser. No. 806,574
Int. Cl.[4] F04B 43/00; F01B 19/00
U.S. Cl. 417—472 5 Claims



1. A hydrostatic pump, comprising, in combination,
at least one working chamber for the reception and exhaustion of a fluid, inlet means and outlet means communicated to said chamber, at least one pair of coned rings adjacent to said chamber to border said chamber at least partially in two axially opposed directions with said coned rings symmetrically arranged about said chamber, at least one piston movable along its longitudinal axis to at least indirectly bear on one of said coned rings with said piston subjected to a drive means to move said piston along its longitudinal axis in periodic reciprocal movements to periodically increase and decrease the volume of said chamber by periodically expanding and compressing said coned rings and an improvement,
wherein said improvement comprises a combination,
wherein said combination includes the provision of an outer ring with planar axial end faces and said outer ring provided between the radial outer ends of said coned rings,
wherein said outer ring plate provides a distance between said coned rings and a seal ring bed radially inward of said outer ring and between said coned rings,
wherein a flexible seal ring is inserted into said seal ring seat,
wherein a planar inner ring of a thickness substantially equal to the thickness of said outer ring is inserted radially inward of said seal ring and between said coned rings, and,
wherein said outer ring extends radially outwardly beyond the outer diameters of said coned rings,

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4,690,624

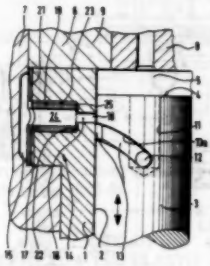
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Reinhard Schwartz, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 17, 1986, Ser. No. 886,454
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1985, 3535808
Int. Cl.[4] F02M 59/26
U.S. Cl. 417—499 18 Claims

1. A fuel injection pump for internal combustion engines having at least one pump cylinder, a fuel chamber, a diversion bore in said pump cylinder that extends to said fuel chamber, a

pump piston that operates in said pump cylinder, said pump piston has a control edge cooperating with said diversion bore for an end of fuel supply, and a device in said diversion bore for preventing erosion, said diversion bore (14) is embodied as two segments, a stepped bore having a short, precisely disposed segment (16) of smaller diameter, and a longer segment (17) of larger diameter, said short segment (16) of smaller diameter



forms a precisely embodied inlet (18) which cooperates with said control edge of said pump piston (3), said longer segment (17) of larger diameter includes therein said device (19) for preventing erosion, said device is formed by a liner (19) of erosion-resistant material having an inner bore (24) which has a diameter at least as large as that of said shorter segment (16) of said diversion bore (14).

4,690,625

SCROLL-TYPE FLUID MACHINE WITH CONFIGURED WRAP EDGES AND GROOVES

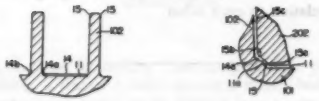
Akira Murayama; Hiroaki Kuno; Naoshi Uchikawa; Takahiro Tamura; Takao Mizuno; Kazumi Aiba; Mitsuo Ikeda, and Kiyoshi Fukatsu, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 27, 1985, Ser. No. 813,719

Claims priority, application Japan, Jan. 9, 1985, 60-848

Int. Cl.[4] F01C *1/04, 21/08*

U.S. Cl. 418—55 3 Claims



1. A scroll-type fluid machine comprising an orbiting scroll member and a stationary scroll member, each of said scroll members having an end plate and a spiral wrap protruding upright therefrom, said scroll members being assembled together with their wraps meshing with each other, said orbiting scroll member being movable to execute an orbiting motion so that closed spaces defined by the wraps and end plates of both scroll members are progressively moved towards the center thereof while decreasing their volumes in accordance with the orbiting movement of said orbiting scroll member, wherein steps are formed at respective corners of a groove bottom between adjacent turns of the wrap of each scroll member so that said groove bottom is formed in a different configuration from that defined between adjacent turns of the wrap of each scroll member, and edges of a projecting end of the wrap of each scroll member facing said steps are chamfered to avoid a collisions of said projecting wrap end with said steps.

4,690,626

ROTATIONAL MOLD SYSTEM WITH MULTIPLE STATIONS

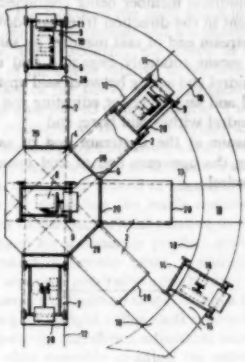
Horst Krzepinski, Schulstrasse 23, 6837 St. Leon-Rot 1, Fed. Rep. of Germany

Filed Oct. 8, 1985, Ser. No. 785,548

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 8429732[U]

Int. Cl.[4] B29C *41/04*

U.S. Cl. 425—88 14 Claims



1. A rotational molding apparatus, comprising:

a mold filling station;

a heating chamber;

means for supporting at least one mold for forming workpieces; and

at least three cooling chambers arranged operatively adjacent and circularly around a center at which the heating chamber is disposed;

wherein said mold is movable between said mold filling station, said heating chamber and said cooling chambers.

4,690,627

ROTARY EXTRUSION HEAD MORE ESPECIALLY FOR MANUFACTURING CABLES WITH HELICAL GROOVES FOR OPTICAL FIBERS

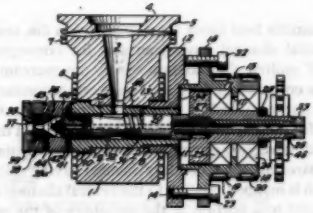
Michel Sebille, Carrieres-Sur-Seine, France, assignor to Treficable Pirelli, Saint Maurice, France

Filed Nov. 21, 1985, Ser. No. 800,517

Claims priority, application France, Nov. 21, 1984, 84 17735

Int. Cl.[4] B29C *47/06*

U.S. Cl. 425—113 6 Claims



1. An extrusion head for applying a layer of a material to a core as it is advanced, said extrusion head comprising:

a head body having mandrel receiving bore extending therethrough and a duct extending transversely to said bore for supplying said material to said bore;

a mandrel rotatably and axially movably mounted in said bore, said mandrel having a downstream end and an up-

stream end and a screw threaded portion intermediate said upstream end and said downstream end and within said bore for advancing said material within said bore in the direction of said downstream end with rotation of said mandrel and said mandrel having an axial passageway therein for the passage of said core therethrough;

a die assembly secured to said mandrel at said downstream end thereof for rotation therewith, said assembly comprising a hollow cylindrical member carrying a die with an opening aligned with said passageway in said mandrel and said cylindrical member being restrained with respect to movement in the direction from said downstream end to said upstream end of said mandrel by said body;

adjusting means rotatably engaging said upstream end of said mandrel and acting between said upstream end of said mandrel and said body for adjusting the axial position of said mandrel within said bore; and

driving means at the upstream end of said mandrel and engaging the upstream end of said mandrel for rotating said mandrel.

4,690,628

ADJUSTABLE FEED BLOCK FOR COEXTRUSION DIE

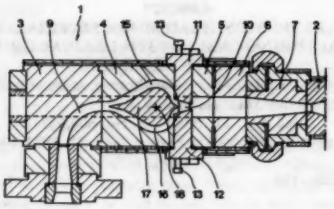
Claude Dehennau, Waterloo, and Paul Dubois, Ghislenghien, both of Belgium, assignors to Solvay & Cie. (Societe Anonyme), Brussels, Belgium

Filed Oct. 8, 1985, Ser. No. 785,591

Claims priority, application France, Oct. 18, 1984, 84 16100

Int. Cl.[4] B29C *47/06*

U.S. Cl. 425—133.5 **6 Claims**



1. Adjustable feed block for a coextrusion die, comprising a main central channel having an axis for conveying a main stream of molten thermoplastic in a downstream direction towards a coextrusion die and at least one secondary channel, having a portion which is substantially parallel to the central channel, for conveying a second stream of molten thermoplastic in the downstream direction to form a local coating layer on the main stream, each secondary channel having a downstream end which is inclined relative to the central channel and which is connected to a portion of the periphery of the said central channel, wherein a connection between the central channel and each secondary channel is laterally delimited by ends of two adjustable slides which can be moved in a direction at right angles to a plane containing the axis of the central channel, and wherein each secondary channel is subdivided into two curved branches which join together again before the respective second stream of molten thermoplastic reaches the connection to the central channel.

4,690,629

INJECTION MOLDING MACHINE FOR SMALL-SIZED ARTICLES

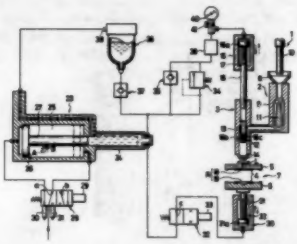
Yoichi Horikawa, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 876,275

Claims priority, application Japan, Jun. 19, 1985, 60-131643

Int. Cl.[4] B29C *45/02, 45/70*

U.S. Cl. 425—156 **6 Claims**



1. An injection molding machine for small-sized articles of thermoplastic synthetic resin, comprising:

(a) a support;

(b) a mold supported on said support, said mold including a pair of first and second mold members jointly defining a mold cavity therebetween, said first mold member being fixed to said support, and said second mold member being movable toward and away from said first mold member;

(c) an injection unit having an injection cylinder through which molding material is to be injected through said first mold member into said mold cavity;

(d) a hydraulically pressurizable injection head cylinder supported on said support and operable on said injection cylinder for injecting the molding material into said mold cavity;

(e) a hydraulically pressurizable clamping cylinder supported on said support and operable on said second mold member for opening and closing said mold; and

(f) a booster operatively connected to both said injection head cylinder and said clamping cylinder for converting pneumatic pressure into high hydraulic pressure to actuate said injection head cylinder and said clamping cylinder in timed relation to each other.

4,690,630

DEVICE FOR STRIPPING FROM A MOLD A COMPOSITE ELECTRICAL INSULATOR

Patrick Gissinger, Mariol, and Yves Poutignat, Puy Guillaume, both of France, assignors to Ceraver, Paris, France

Filed Apr. 24, 1986, Ser. No. 855,260

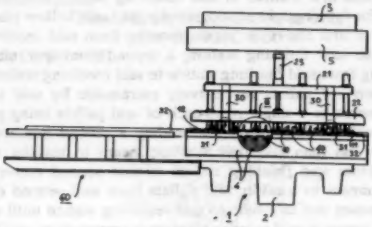
Claims priority, application France, Mar. 25, 1986, 86 04279

Int. Cl.[4] B29C *33/44*; B25J *15/10*

U.S. Cl. 425—236 **5 Claims**

1. In a press molding apparatus having top and bottom mold members defining mold cavities suitable for molding a composite electrical insulator having a core member and a finned casing of elastomer sheds, the improvement comprising a stripping device having a frame movable in translation relative to said press on guideways parallel to the axis of the insulator core, said frame comprising a carrying beam supporting a cylinder actuator and a beam parallel to the carrying beam and movable in vertical translation by means of said cylinder, the movable beam being equipped with a plurality of gripping modules for acting upon a few of the said sheds, each module

having a first bearing part for part of one side of a shed and a second part having a recess, and an inflatable packing within



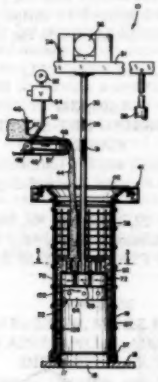
said second part for application against the corresponding part of the other side of the shed fin.

4,690,631

PACKERHEAD WITH ELASTIC ROLLERS

Michael L. Haddy, Harlinger, Tex., assignor to Hydrotile Machinery Company, Nashua, Iowa

Filed Mar. 6, 1986, Ser. No. 837,097
Int. Cl.[4] B28B *21/24*
U.S. Cl. 425—262 **26 Claims**



1. A machine for making concrete pipe in an upright mold comprising: a frame, a mold having a mold chamber for accommodating concrete to be formed into a concrete pipe, a packerhead movable in said mold chamber for forming a concrete pipe within said mold, cross head means movably mounted on said frame, means connected to said cross head means to selectively raise and lower the cross head means, means connecting the cross head means to said packerhead whereby said packerhead moves with said cross head means, drive means mounted on the cross head means for rotating said packerhead during upright movement thereof; means for supplying concrete to the mold chamber during the rotation and upright movements of the packerhead whereby the packerhead forms the concrete pipe in the mold, said packerhead comprising a generally circular plate, said means connecting the cross head means to said packerhead including means secured to the center of the plate connected to the drive means, a plurality of rollers rotatably mounted on the plate for rotation about separate generally upright axes for packing concrete in a cylindrical shape within the mold, each of said rollers having an upright roller shaft secured to the plate and projected upwardly therefrom, means mounting the shaft on the plate including an eccentric bushing attached to the shaft, said plate having a hole accommodating said bushing, said bushing being rotatable to adjust the radial position of the roller relative to the plate to vary the packing pressure of the roller on the concrete, and means for holding the bushing in an adjusted position, a generally cylindrical body surrounding said roller shaft, said body having a top end and a generally cylindrical outer surface, bearing means rotatably mounting the body on the roller shaft, a cap mounted directly on the top end of said body closing the upper end thereof, at least one upright fin secured to said cap, a continuous annular sleeve of elastic rubber material surrounding the body and mounted on the cylindrical outer surface thereof, said sleeve having a length about the same as the length of the body and a uniform thickness throughout the length thereof and a continuous cylindrical outer surface, means securing the sleeve to said body to prevent rotation of the sleeve relative to the body, said cylindrical outer surface of the sleeve being engageable with concrete in the mold chamber to insure rotation of the roller and packing of the concrete in the mold, cylindrical side wall secured to the plate and projected downwardly therefrom; and cylindrical trowel means secured to said side wall, said trowel means includes a cylindrical trowel of elastic material having an outer surface for troweling the inside surface of the pipe during movement of the packerhead relative to the mold.

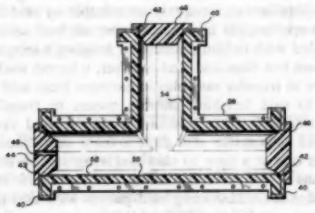
21. A packerhead for a concrete product making machine comprising: a generally circular plate, a plurality of rollers rotatable about separate generally upright axes for packing concrete in a generally cylindrical shape within a mold, each of said rollers having an upright roller shaft secured to the plate and projected upwardly therefrom, adjustable means mounting the shaft on the plate operable to adjust the radial position of the roller relative to the plate to vary the packing pressure of the roller on the concrete, a body surrounding said roller shaft, said body having a generally cylindrical outer surface, means rotatably mounting the body on the roller shaft, elastic sleeve means surrounding the body and mounted on the cylindrical outer surface thereof, said elastic sleeve means having a length about the same as the length of the body and uniform thickness throughout the length thereof and a continuous outer surface, means securing the sleeve means to the body to prevent rotation of the sleeve means relative to the body, said cylindrical outer surface of the sleeve means being engageable with concrete in the mold to insure rotation of the roller and the packing of the concrete in the mold.

4,690,632

METHOD AND APPARATUS FOR MOLDING HOLLOW ARTICLES

Guy E. Carrow, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 521,761, Aug. 9, 1983, Pat. No. 4,666,650. This application Jun. 10, 1985, Ser. No. 743,131
Int. Cl.[4] B29C *39/26, 41/06*
U.S. Cl. 425—429 **6 Claims**



1. Apparatus for producing a hollow article, comprising:

a mold assembly having a cavity therein generally corresponding to the exterior shape of the article to be produced and having at least one portion defining a generally tubular sidewall of said article, said mold assembly having

an aperture therein communicating with the interior thereof at the extremity of said portion defining the generally tubular sidewall of said article;

plug means for closing said aperture said plug means defining vent means therein in the form of a vent hole extending through said plug means and terminating in a generally flat face of said plug means toward said cavity, in said mold assembly and usable for opening said aperture;

means for securing said plug means in position closing the aperture in said mold assembly;

means secured to said mold assembly for revolving said mold assembly about at least two nonparallel axes of rotation, said means being adapted to simultaneously revolve said mold assembly about each of said axes of rotation continuously in one direction through an angle of rotation greater than 360°; and

means for heating said mold assembly and the contents of the cavity therein including means for circulating hot gas through said cavity in said mold assembly.

4,690,633

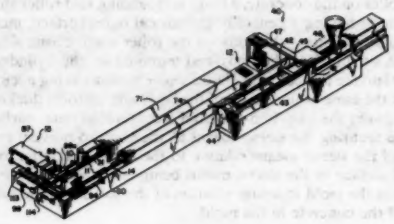
APPARATUS FOR PREPARING HOLLOW PLASTIC ARTICLES

Robert D. Schad, Toronto; Herbert Rees, Orangeville; Gary Hughes, Nobleton, and John R. Murchie, Aurora, all of Canada, assignors to Husky Injection Molding Systems Ltd., Bolton, Canada

Continuation-in-part of Ser. No. 648,793, Sep. 7, 1984, Pat. No. 4,522,581. This application May 14, 1985, Ser. No. 733,969

Int. Cl.[4] B29C *49/02, 49/06*

U.S. Cl. 425—526 **13 Claims**



1. An apparatus for preparing hollow plastic articles said apparatus comprising: a receiving station for receiving a first number of plastic parisons; an injection molding machine in spaced relationship to said receiving station for injection molding said first number of plastic parisons in an injection molding cycle for transfer to said receiving station and means for transferring said first number to said receiving station; a finishing station for forming said plastic parisons into said hollow plastic articles; a first conveyor means moving from said receiving station to said finishing station; a second conveyor means returning from said finishing station to said receiving station; a multiplicity of pallets successively entrainable by said first and second conveyor means in a single row, each of said pallets being provided with holding means for holding a second number of parisons less than said first number, wherein said pallets are operative to transfer said plastic parisons from said receiving station to said finishing station; means to transfer said pallets from said finishing station to said second conveyor means; means to transfer said pallets from said second conveyor means one at a time to said receiving station until said holding means at said receiving station corresponds to said first number; means for transferring said pallets with said parisons thereon one at a time from said receiving station to first conveyor means; and means for transferring said pallets with said parisons thereon one at a time from said first conveyor means to said finishing station to form hollow plastic articles.

13. An apparatus for preparing hollow plastic articles said apparatus comprising: a receiving station for receiving a first number of plastic parisons; an injection molding machine in spaced relationship to said receiving station for injection molding said first number of plastic parisons in an injection molding cycle for transfer to said receiving station and means for transferring said first number to said receiving station; a finishing station for forming said plastic parisons into said hollow plastic articles; a first conveyor means moving from said receiving station to said finishing station; a second conveyor means returning from said finishing station to said receiving station; a multiplicity of pallets successively entrainable by said conveyor means in a single row, each of said pallets being provided with holding means for holding a second number of parisons less than said first number; means to transfer said pallets from said finishing station to said second conveyor means; means to transfer said pallets from said second conveyor means one at a time to said receiving station until said holding means at said receiving station corresponds to said first number; means for transferring said pallets with said parisons thereon one at a time from said receiving station to first conveyor means; and means for transferring said pallets with said parisons thereon one at a time from said first conveyor means to said finishing station to form hollow plastic articles, including a post-cooling means between the injection molding machine and receiving station for post-cooling the parisons, carrying means for transporting said parisons from said injection molding machine to said receiving station provided with heat transfer means to post-cool the parisons from the injection molding machine, wherein said carrier means comprises an open ended tube having a taper corresponding to the taper of the parison but somewhat smaller than the parison so that said heat transfer means is operative to shrink the parison upon cooling with the parison sliding inside the tube to fit snuggly therein.

4,690,634

METHOD OF MEASURING DRY SUBSTANCE IN FLUE GASES

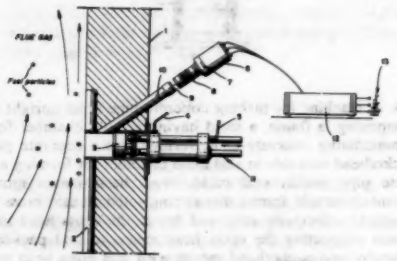
Torbjörn Herngren, Älvsjö, and Jon Lofthus, Sollentuna, both of Sweden, assignors to Svenska Traforskningsinstitutet, Stockhold, Sweden

Filed May 22, 1986, Ser. No. 865,848

Claims priority, application Sweden, May 31, 1985, 8502697

Int. Cl.[4] F23C *5/00*; F23M *3/02*

U.S. Cl. 431—8 **20 Claims**

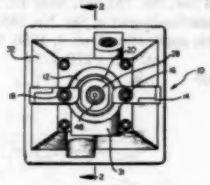


1. A method of measuring dry substance in the flue gas in liquor recovery units in mills for the manufacture of papermaking pulp and thereby render it possible to predict coats on heat surfaces, control of the size of fuel drops, control of the distribution of the fuel drops in the incinerator and/or control of the intensity of cleaning the heat surfaces of the boiler from soot, wherein radiation emitted from the combustion of fuel particles in the hearth of the liquor recovery unit above the fuel supply level is detected optically in the combustion chamber, the number of pulses of the signal received from the detection is determined and used as a measure of the number of fuel particles, and the signal is used for an indication and/or control of the operation of the unit.

4,690,635
HIGH TEMPERATURE BURNER ASSEMBLY

William Coppin, Muncie, Ind., assignor to Maxon Corporation, Muncie, Ind.

Filed Jul. 21, 1986, Ser. No. 887,441
Int. Cl.[4] F23C 7/00
U.S. Cl. 431—187 11 Claims



1. In a high temperature burner assembly having a nozzle body for containing and conveying oxygen, a gas conduit disposed within the nozzle body and having means for directing a gaseous fuel therethrough to be expelled from the conduit and to mix with the oxygen for burning in a sustainable flame, and for use in association with a refractory burner block for substantially containing such flame, the improvement comprising:

a gas conduit tip connected to the gas conduit and including a substantially flat exteriorly disposed tip face, said tip face having a substantially frusto-conical shaped prominence disposed on and protruding from said tip face;

said gas conduit tip having a central gas channel centrally disposed therethrough and terminating at the proximal end of said frusto-conical shaped prominence to form substantially a knife edge shaped rim for briefly delaying combustion and to provide no substantial available surface for carbon accumulation thereon; and

primary oxygen expelling orifice means opening concentrically about the base of said frusto-conical shaped prominence for directing oxygen outwardly therefrom to mix with the gaseous fuel for initial combustion.

4,690,636
FLAT TYPE GAS BURNER, MORE PARTICULARLY FOR HOUSEHOLD APPLIANCES, ADAPTED FOR USING DIFFERENT GASES

Jean B. Lemonnier de Gouville, and Bernard Dane, both of Veigne, France, assignors to Sourdillon-Airindex, France

Filed Jan. 10, 1986, Ser. No. 817,727
Claims priority, application France, Jan. 30, 1985, 85 01311
Int. Cl.[4] F23D 14/62
U.S. Cl. 431—354 7 Claims

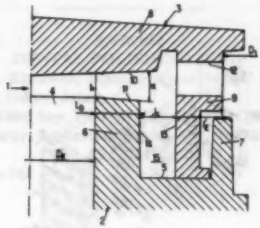
1. A flat type burner, more particularly for household applicances, comprising a burner body (2) with an axial, vertical and cylindrical gas mixture delivery passage (4) housing a gas injector (25) and a cap (8) covering the burner body (2) and resting thereon through an annular ring (9) having circumferentially spaced flame orifices (12), the annular surface (11) of the burner body bordering the opening of the gas mixture delivery passage (4) and the opposite surface (10) of the cap (8) defining an annular convergent-divergent system extending approximately transversely to the axis of the gas delivery passage, the burner body (2) and the annular ring (9) further defining between their opposite faces an annular decompression chamber (15) situated between said convergent-divergent system and the flame orifices (12), characterized in that:

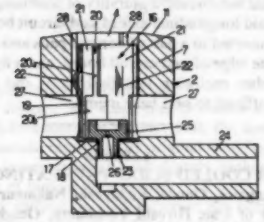
(a) the diameter (D_E) of the gas mixture delivery passage is determined by:

$$D_E = D_c K_3$$

where K_3 is a coefficient substantially between 1.10 and 1.34, (respectively for burner powers greater than 0.6 kW) determined for each value of D_c by the chart shown in FIG. 4, and D_c is the frustro-conical diameter equivalent to the Venturi diameter of the said annular convergent-divergent system, determined by

$$D_c = D_I K_4$$





with D_I = diameter (in mm) of the injector for butane gas and K_4 = coefficient substantially between about 12.5 and 22 determined for each value of D_I from the charge of FIG. 3,

(b) an angle (α) formed by the opposite truncated cone shaped surfaces (10, 11) defining the annular convergent-divergent system is between about 3° and 8°,

(c) a length (L_D) of the divergent system is determined by:

$$L_D = \frac{D_1 - D_E}{2} - (l_E + l_c)$$

where

D_1 = outer diameter of the ring

l_E = thickness of the ring

l_c = thickness of the expansion chamber

(d) and mechanical means (16) within the gas delivery passage for setting, for each type of gas usable in the burner, the venturi diameter equivalent (D_c) of the annular convergent-divergent system.

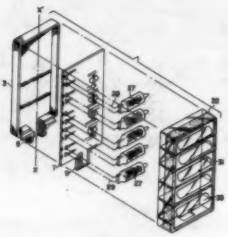
4,690,637
SIDE-MOUNTED FLASHLAMPS

Boyd G. Brower, Williamsport, Pa., assignor to GTE Products Corporation, Danvers, Mass.

Continuation-in-part of Ser. No. 708,928, Mar. 6, 1985, abandoned. This application Feb. 19, 1986, Ser. No. 831,227
Int. Cl.[4] G03B 15/02
U.S. Cl. 431—359 9 Claims

1. In a miniaturized multilamp photoflash array having a base member formed to receive a circuit board having a longitudinal axis, a tab member and a printed circuit thereon, the improvement wherein said printed circuit is on a single surface of said circuit board and includes an electrically conductive

circuit extending from said tab member along one edge of said circuit board and parallel to said longitudinal axis, a plurality of spaced contact pads extending along an opposite edge of said circuit board and parallel to said longitudinal axis, a hot circuit extending from said tab member, a plurality of normally-open (N/O) switches connecting said hot circuit to a following flashlamp upon activation of a flashlamp, a plurality of



normally-closed (N/C) switches for connecting said common circuit to said hot circuit, a plurality of flashlamps each aligned normal to said longitudinal axis of said circuit board with a pair of leads connected to a pair of contact pads and extending over said opposite edge of said circuit board, and a light transparent cover member enclosing said flashlamps and printed circuit board and affixed to said base member.

4,690,638

WATER COOLED SCRAP PREHEATING BUCKET

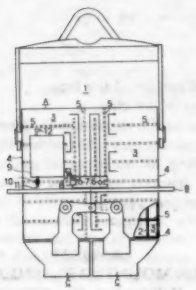
Fumio Nakagawa, Onoda; Kazuyoshi Nakamura; Hitoshi Shibao, both of Ube; Hiroshi Yoshimura, Onoda; Koichi Taki, Onoda; Makoto Inoue, Onoda; Eiji Hayashi, Onoda; Fusao Dejima, Onoda, and Yuritoshi Kohara, Onoda, all of Japan, assignors to Yamaguchikyoei Industry Co. Ltd., Japan

Filed Aug. 1, 1986, Ser. No. 892,012

Claims priority, application Japan, Aug. 6, 1985, 60-173672; Aug. 6, 1985, 60-173673; Aug. 6, 1985, 60-121402[U]; Aug. 6, 1985, 60-121403[U]; Nov. 27, 1985, 60-268044; Jan. 17, 1986, 61-5706[U]

Int. Cl.[4] F27D *15/02*

U.S. Cl. 432—81 **12 Claims**



1. A bucket cooled by circulating water for use in preheating scrap to be charged into an electric furnace, which comprises;

a bucket-shaped container which contains scrap to be preheated and through which an exhaust gas from an electric furnace is passed to preheat the scrap contained therein;

a cooling water passageway which surrounds the periphery of said container; and

water supply and exhaust ports which are connected to said cooling water passageway, cooling water being supplied to and exhausted from the bucket during preheating of the scrap contained therein.

4,690,639

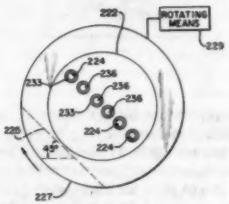
CONSTANT PRESSURE VARIABLE ORIFICE BURNER NOZZLE ASSEMBLY

James T. Voorheis, Essex Fells, N.J., assignor to Voorheis Industries, Inc., Fairfield, N.J.

Continuation of Ser. No. 733,557, May 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 585,087, Mar. 1, 1984, abandoned. This application Dec. 3, 1986, Ser. No. 937,435

Int. Cl.[4] F27B *7/34*

U.S. Cl. 432—105 **13 Claims**



1. A rotary kiln comprising:

a rotary tube for containing material to be burned, said rotary tube having a longitudinal axis, and said material tending to form a chordal incline at a substantially constant angle relative to a fixed reference frame as said tube containing said material is rotated in a given direction;

means for rotating said tube about its longitudinal axis; and

a burner gun at a first end of said tube, said burner gun including:

(a) conduit means having an inlet, an outlet at said first end of said tube and a longitudinal axis;

(b) gas inlet means for supplying a gas to said inlet of said conduit means;

(c) gas outlet means for emitting said gas supplied to said conduit means, said gas outlet means including a plurality of orifices arranged in at least one linear row at said outlet of said conduit means, each orifice having a longitudinal axis substantially parallel to the longitudinal axis of said conduit means, each linear row being arranged substantially parallel to said incline;

(d) a plurality of orifice plug means, each axially adjustable with respect to a respective one of said orifices; and

(e) control means for simultaneously adjusting said plurality of orifice plug means with respect to said plurality of orifices to vary the openings of said plurality of orifices so as to provide a constant gas velocity at the outlet of said conduit means.

4,690,640

ORAL VESTIBULE PLATE FOR PROPHYLACTIC PURPOSES AND EARLY ORTHODONTIC TREATMENT

Relf Hinz, Kornerstrasse 6, D-4690 Herne 1, Fed. Rep. of Germany

Filed Nov. 18, 1985, Ser. No. 798,901

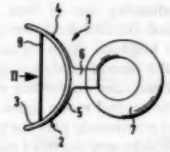
Int. Cl.[4] A61C *7/00*

U.S. Cl. 433—6 **8 Claims**

1. An appliance for prophylaxis and early orthodonic treatment of children, said appliance comprising:

a curved, rigid shield of plastic material suitable for being inserted into the vestibule of the mouth of the wearer, said shield having a smooth concave inner surface, said shield having a post affixed to the middle portion of the outer surface and extendable through the lips of the wearer for receiving an appliance holding means on the exposed end; and

a wire crosspiece disposed across said shield along a line forming a secant of the curvature of said shield, said crosspiece having a pair of straight end portions disposed generally on a central plane of said shield that is oriented horizontally when said appliance is worn by an upright wearer, each of said end portions having an end mounted in said inner surface of said shield, said end portions extending inwardly from said inner surface along said secant line, said crosspiece having a central portion intermediate said end portions and lying on said secant line, said central



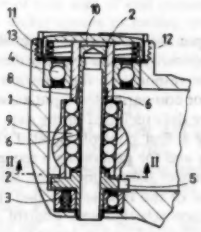
portion having a generally sinusoidal configuration including at least one central generally U-shaped bend extending in one direction with a generally U-shaped bend on either side thereof extending in an opposite direction, said central portion lying in a single plane containing said secant line and normal to said central plane with said U-shaped bends extending in opposite directions in said single plane, said crosspiece serving to hold back the tip of the tongue by means of said central portion when said appliance is worn.

4,690,641

CONTRA-ANGLE OR TURBINE HEAD OF A DENTAL HANDPIECE

Jean-Jacques Luiset, Geneva, Switzerland, and Michel Seigneurin, Douvaine, France, assignors to Micro-Mega S.A., Besancon, France

Filed Feb. 3, 1986, Ser. No. 825,233
Claims priority, application France, Feb. 4, 1985, 85 02145
Int. Cl.[4] A61C *1/14*
U.S. Cl. 433—129 **16 Claims**



1. A head of a dental hand piece comprising a head case, a chuck for receiving a smooth shank of a dental tool rotatably mounted in said case, means for driving said chuck in rotation about an axis, said chuck comprising a sleeve adapted to receive a smooth shank of a dental tool and provided with at least one elongate, axially extending clamping claw movable radially between an inner position for clamping said dental tool shank and an outer position for releasing said dental tool shank, an actuating member movable axially relative to said sleeve, said actuating member and clamping claw having in opposed surfaces elongate longitudinal grooves which face one another to form an elongate ramp way for rolling elements, an plurality of rolling elements disposed in a row in said ramp way, said ramp way extending in a generally axial direction but inclined at a small angle to said axis of rotation in such manner that axial movement of said actuating member relative to said sleeve acts through said ramp way and rolling elements to produce radial movement of said clamping claw, means for resiliently urging said clamping claw inwardly toward said clamping position and releasing means for manually moving said actuating member axially relative to said sleeve in a direction to move said clamping claw radially outwardly to said outer releasing position.

4,690,642

DENTAL POLISHING STRIP

Ikuo Kyotani, Kitamoto, Japan, assignor to G-C Dental Industrial Corp., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,756
Claims priority, application Japan, Nov. 9, 1984, 59-235046
Int. Cl.[4] A61C *3/06*
U.S. Cl. 433—142 **12 Claims**

1. A dental polishing strip comprising:
(a) a substrate formed of a shape-memory alloy selected so that, after deformation by contact with the teeth during use, said substrate returns to its original shape upon being heated to a temperature at least slightly higher than the temperature of human mouths and
(b) a polishing surface on said substrate for polishing the proximal surfaces of teeth or fillings in the proximal cavity.

4,690,643

DENTAL FASTENING DEVICE AND METHOD OF USE

Carl H. Rousseau, 1510 Barry St., Clearwater, Fla. 33516

Filed Mar. 10, 1986, Ser. No. 838,245
Int. Cl.[4] A61C *11/00*
U.S. Cl. 433—213 **12 Claims**

1. A dental fastening device for fastening a wax substructure of a subsequently fabricated dental bridge adjacent to a first and second dental die of a cast during the fabrication and shaping of the substructure, the substructure having a pontic portion disposed between a first and a second abutment portion, the fastening device inhibiting relative movement between the pontic and abutment portions during hardening and shrinkage of the substructure, said fastening device comprising in combination:
a first elongate tie down member having a first and a second end, said first member fastening the first abutment portion of the wax substructure against movement relative to the first die, said first end of said first tie down member being anchored to the lingual face of the cast adjacent to the first die, said second end of said first tie down member being anchored to the buccal face of the cast adjacent to the first

die, said first tie down member extending from the lingual face of the cast adjacent to the first die over the occlusal surface of the first abutment portion and around to the buccal face of the cast adjacent to the first die; and

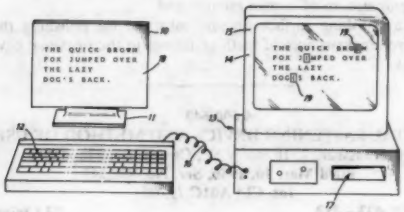
a second elongate tie down member having a first and a second end, said second member fastening the second abutment portion of the wax substructure against movement relative to the second die, said first end of said second tie down member being anchored to the lingual face of the cast adjacent to the second die, said second end of said second tie down member being anchored to the buccal face of the cast adjacent to the second die, said second tie down member extending from the lingual face of the cast adjacent to the second die over the occlusal surface of the second abutment portion and around to the buccal face of the cast adjacent to the second die such that during the hardening and inherent shrinkage of the wax substructure, said first and second die down members cooperate together for inhibiting relative movement between the pontic portion and the adjacent abutment portions of the wax substructure so that the subsequently fabricated dental bridge will be an accurate fit.

4,690,644

TEACHING APPARATUS, PARTICULARLY FOR TEACHING SHORTHAND

Robert G. Flanders, and Marguerita E. Flanders, both of Dico Education International, 247 Court Road, London, England (SE9 4TQ)

Filed Dec. 23, 1985, Ser. No. 812,138
Int. Cl.[4] G09B 11/00
U.S. Cl. 434—158 **1 Claim**



1. An apparatus for use in teaching, comprising: a series set of printed sheets carrying information for use in teaching shorthand each set including a lesson page, a page printed with text, a page printed with a shorthand version of said text, and at least a partially blank sheet wherein each set is progressively more difficult;

a keyboard having its keys marked with symbols which include those related to the said shorthand teaching sheets;

a computer; and

program means in said computer, to program the computer in relation to said information to check the accuracy of a student's transcription of at least part of the information by indicating the performance of the student.

4,690,645

INTERACTIVE EDUCATIONAL DEVICE

Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,410
Int. Cl.[4] G09B 7/06
U.S. Cl. 434—309 **12 Claims**

1. An educational device adapted to receive a tape cassette having voice signals and data signals stored thereon, comprising:

driving means for driving the tape cassette;

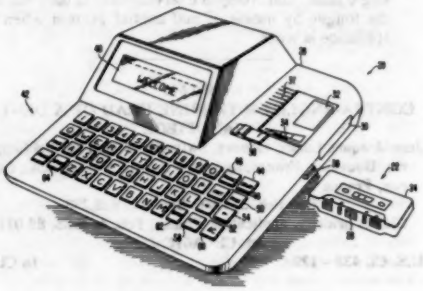
reading means for reading the voice signals and data signals stored on the tape cassette, and for generating a voice playback signal and a data playback signal for each of the stored voice signals and data signals, respectively, the voice playback signal including a question and the data playback signal including data representing the correct answer to the corresponding question;

means for generating an audio signal, including the question, based on the voice playback signal;

user input means, actuated by a user, for inputting answer data in response to each of the questions, said user input means including means for inputting first, second or third mode signals indicating one of first, second and third modes of operation, the first mode being a mode in which the tape cassette has both voice signals and data signals stored thereon, the second mode being a mode in which the tape cassette includes only voice signals, so that the user can input the second mode signal when said educational device is to continously play the tape cassette incuding only voice signals, and the third mode corresponding to an internal game stored in said educational device;

display means including means for displaying the answer data as it is input by the user through said user input means, and means for generating first or second display signals to indicate whether the input answer data is correct or incorrect; and

control means for receiving the data playback signal, for controlling said driving means to drive the tape cassette in



dependence upon the data playback signal, so that the tape cassette is temporarily halted to allow the user to input the answer data in response to the question included in the audio signal, for comparing the input answer data with the correct answer data included in the data playback signal, for generating a first control signal if the input answer data is correct and for generating a second control signal if the input answer data is incorrect, said display means generating one of the first and second display signals in dependence upon whether said control means generates the first control signal or the second control signal, said control means including:

means for storing data corresponding to the internal game, said control means generating internal game display control signals or internal game audio control signals in accordance with the data corresponding to the internal game, said display means generating a display in response to the internal game display control signals, said means for generating an audio signal generating audio signals in response to the internal game audio control signals, said control means judging the input answer data input by the user via said user input means in response to the display generated by said display means or the audio signal generated by said means for generating an audio signal, and said control means causing said display means to generate a score based on the answer data input by the user.

4,690,646

IC PACKAGE CONNECTOR WITH CONTACTS OF HIGH DENSITY

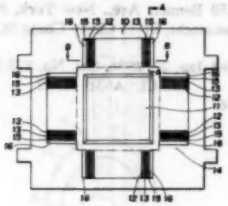
Suegi Sibata, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed May 29, 1986, Ser. No. 868,047

Claims priority, application Japan, May 29, 1985, 60-80729[U]

Int. Cl.⁴ H01R *23/72*

U.S. Cl. 439—71 **1 Claim**



1. An IC package connector having closely spaced contacts, comprising:

a connector body;

an IC package accommodation section formed in the center of said connector body, said body having a wall extending around said accommodation section;

at least one pair of rows opposed to each other on opposite sides of said IC package accommodation section, each of said rows comprising a plurality of parallel partition walls at the same pitch and having a small thickness, a plurality of contact implanting slits defined between adjacent partition walls and having a small width, two separator walls having a thickness substantially the same as the thickness of said partition walls and disposed outside of the end partition walls at opposite ends of said rows and spaced from said end partition walls a distance substantially the same as the width of the contact implanting slits, and two buffer spaces having a width substantially larger than the width of one of said slits and each having one side wall constituted by the outside surface of the corresponding separator wall and the other side wall constituted by an inner surface of said wall of said connector body, at least part of said buffer spaces extending completely through the thickness of said wall of said connector body; and

a plurality of contacts in the contact implanting slits.

4,690,647

ELECTRICAL CONTACT FOR RECEIVING TWO CONDUCTORS

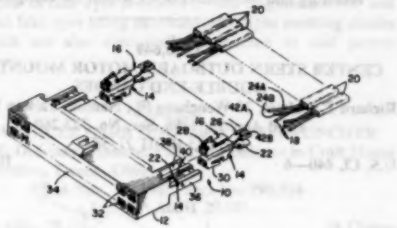
Wilbur A. Hamsher, Jr., New Cumberland, and William B. Long, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 3, 1986, Ser. No. 882,048

Int. Cl.⁴ H01R *4/66*

U.S. Cl. 439—92 **3 Claims**

1. In a ground terminal for terminating an associated pair of small diameter ground conductor wires of tri-lead electrical cable means without substantially distorting the wires, for a multi-terminal electrical connector for a plurality of signal and associated ground conductor wires to be applied to electrical cable means for use in transmitting electrical signals with high reliability and uniformity, where the ground terminal includes a forward contact section and a terminating section axially rearwardly therefrom, the improvement comprising said terminating section including a spaced pair of discrete conductor-receiving slots coextending forwardly substantially in parallel from a rearward end thereof, the spacing of centers of said slots being about equal to the spacing of said associated ground conductor wires in said tri-lead electrical cable means, whereby said wires are terminable to said ground terminal substantially axially forwardly of the portions thereof within the cable means insulation, and each said slot having a width at at least one axial location selected to be just less than a respective said conductor wire and defined by inside surface portions of opposing side walls to hold a said conductor wire in interfer-



ence fit therein at said at least one axial location to be terminated by laser welding, whereby each said ground conductor wire is weldable to said ground terminal by a discrete laser weld joint needing to be only slightly wider than a corresponding said slot thereby requiring less energy to perform the laser welding and reducing the risk of damaging each said wire.

4,690,648

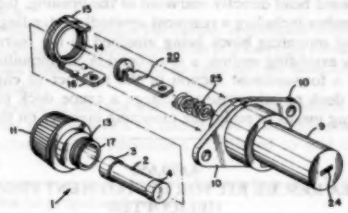
CARTRIDGE FUSE HOLDER

Angelo Urani, Ellisville, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 5, 1985, Ser. No. 720,503

Int. Cl.⁴ H01R *13/08, 13/68*

U.S. Cl. 439—622 **10 Claims**



1. In a cartridge fuse holder for an electrical circuit including a body having an elongated bore open at one end and closed at its other end sized to receive a cartridge fuse having an electrical terminal at each of its ends, a removable mounting cap releasably secured to the body over the open end of the bore adpated to retain the fuse within the bore, and a stationary electrical contact adapted to engage the fuse terminal proximate the open end of the bore to connect said terminal to the electrical circuit, the improvement comprising a movable electrical contact adapted to connect the other fuse terminal proximate the other end of the bore to the electrical circuit, including:

a generally T-shaped contact formed from an integral sheet metal blank of electrically conductive material having a contact head portion reciprocably mounted within the elongated bore adapted to abut said other fuse terminal and a relatively flat shaft portion bent perpendicularly from said head portion, said shaft being located at the approximate center of said T-shaped contact;

a second bore of substantially the same cross-section as said

flat shaft portion extending through the closed end of the body having said shaft portion extending therethrough;

spring means within the elongated bore interposed between the closed end of the body and the said head portion adapted to urge the head portion against said other terminal; and

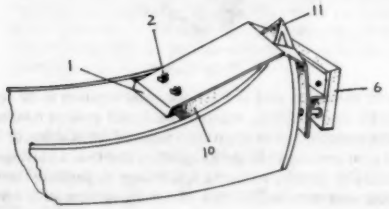
stop means on said shaft portion outwardly of the body retaining said movable contact within the elongated bore.

4,690,649

CENTER STERN OUTBOARD MOTOR MOUNT FOR DOUBLE-END CANOES

Richard E. Zeimet, 25 Wenchang St., Nantou, Taiwan (540)

Filed Apr. 15, 1985, Ser. No. 723,260
Int. Cl.[4] B63H *21/30*
U.S. Cl. 440—6 **10 Claims**



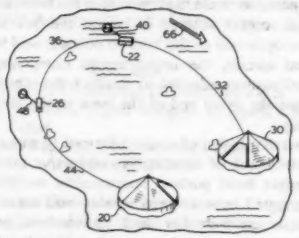
1. A center stern mounting for supporting a motor on a canoe having its sides converging and forming the canoe hull and terminating to form a pointed stern rear edge, the mounting comprising, a mounting member in the form of a single elongated rigid plate extending longitudinally of the canoe from a position forward of the pointed stern rear edge to a position rearward of the pointed stern rear edge, the member including an opening to allow the pointed stern rear edge to protrude therethrough, the member including a downward first bend directly forward of the opening, including a second downward bend directly rearward of the opening, the mounting member including a rearmost upwardly extending section, a motor mounting block being attached to the rearmost upwardly extending section, a third bend in the mounting member at a forwardmost section of the member to engage the canoe deck or otherwise to engage a canoe deck plate, and fastening means to retain the mounting member on the canoe.

4,690,650

SEA RESCUE KIT FOR DEPLOYMENT FROM A HELICOPTER

Larry Bell, 702 Old Sackville Road, Lower Sackville, Nova Scotia, Canada (B4C 2K3)

Filed Jun. 20, 1986, Ser. No. 876,590
Claims priority, application Canada, Mar. 11, 1986, 503,820
Int. Cl.[4] B63C *9/04*
U.S. Cl. 441—40 **4 Claims**



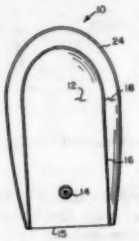
1. A sea rescue kit deployable from a helicopter comprising a first self-inflating life raft, a second self-inflating life raft, a line connecting the first and second life rafts, and means associated with the line to retard the line in the water relative to the life rafts to cause the life rafts and line to assume a substantially horse-shoe-shaped configuration around a predetermined position in the sea after deployment from a helicopter upwind of the predetermined position.

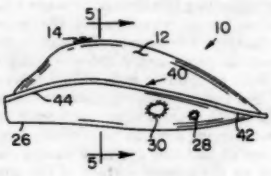
4,690,651

INFLATABLE AQUATIC DEVICE

Sam Samson, 150 Bennett Ave., New York, N.Y. 10040, and Mark J. Gruenspecht, 81-16 Chevy Chase St., Jamaica, N.Y. 11432

Filed Jan. 27, 1986, Ser. No. 823,085
Int. Cl.[4] A63B *31/02*
U.S. Cl. 441—56 **6 Claims**





1. An inflatable aquatic device for use by a swimmer, comprising:

an inflatable chamber formed of flexible material;

a valve formed in said inflatable chamber to effect inflation and deflation thereof;

a flexible sheet element having a front and a rear and being attached to said inflatable chamber substantially around its periphery and including a non-attached peripheral portion at said rear adapted to receive a hand of the swimmer when said inflatable chamber is deflated, said flexible sheet element including a plurality of apertures formed through flat surfaces of said sheet material, through which fingers and thumb of the hand can protrude after being received therein; and

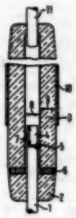
a rigid, U-shaped, flange element having a continuously variable width being wider at a location corresponding to said front of said sheet element and becoming less wide at locations corresponding to said rear of said sheet element, and being attached to said inflatable chamber along the peripheral portion thereof coextensively with said flexible sheet element, the arms of said U-shaped flange being arranged at the rear thereof said flange element being adapted to be substantially flat when said inflatable chamber is uninflated and being curved downwardly relative to said flexible sheet element at said front and said rear when said inflatable chamber is inflated.

4,690,652

METHOD OF MAKING A WALL STABILIZED INFRARED FLASH TUBE

Ingo Dünisch, Wiesbaden, Fed. Rep. of Germany, assignor to Heimann GmbH, Fed. Rep. of Germany

PCT No. PCT/DE83/00138, § 371 Date Mar. 4, 1985, § 102(e) Date Mar. 4, 1985, PCT Pub. No. WO85/00927, PCT Pub. Date Feb. 28, 1985
PCT Filed Aug. 12, 1983, Ser. No. 713,405
Int. Cl.[4] H01J 9/32, 9/36, 61/36, 61/06
U.S. Cl. 445—28 1 Claim



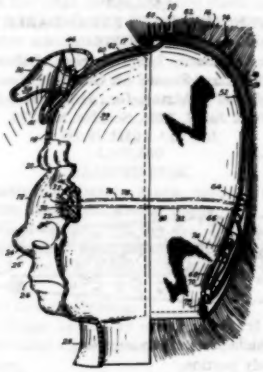
1. A method for manufacturing a wall-stabilized infrared flash tube comprising the steps of: holding a cylindrical electrode member having a cylinder length of at least 1.2 mm which is coated and/or saturated with an activator at its electron generating surface, securing said electrode member to a lead by beam welding by generating a weld having a cross-section less than the cross-section of the lead, inserting the electrode member on said lead into a flash chamber of a glass bulb, and fusing said lead vacuum-tight to the glass bulb.

4,690,653

NOISE MAKING MASK

Mel Goldberg, c/o Topstone Industries, Inc., 2 Augusta Dr., Danbury, Conn. 06810

Filed Oct. 3, 1985, Ser. No. 784,360
Int. Cl.[4] A63H 5/00
U.S. Cl. 446—27 5 Claims



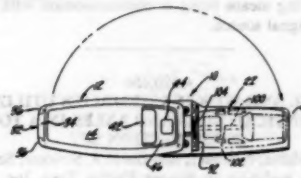
1. A noise-generating mask comprising:
(a) a face covering disguise section having a substantially realistically sized human head form fitting disguise area and a rear portion attached to said face covering forming a hollow structure with an inside surface;
(b) a surface abnormality integrally molded into said disguise area;
(c) a speaker mounted within said surface abnormality;
(d) electronic means for driving said speaker to generate a noise;
(e) power means for powering said electronic means and said speaker;
(f) wiring connecting said speaker, said electronic means and said power means;
(g) a pair of fake eyes provided to said disguise section; and
(h) said fake eyes being provided with light emitting diodes which are also electrically connected to said power means.

4,690,654

TOY VEHICLE CARRYING CASE AND LAUNCHER

George E. DeLaney, Hanover Park, Ill., assignor to Craft House Corporation, Toledo, Ohio

Filed Nov. 18, 1985, Ser. No. 798,924
Int. Cl.[4] A63H 29/00
U.S. Cl. 446—28 24 Claims



1. A toy vehicle carrying closure and launcher comprising, in combination:
an elongate housing having a top and bottom wall;
a retractable belt clip mounted on said housing for carrying said closure on the user's belt and retracting flush with said housing bottom wall when the launcher is placed on a surface for launching;
a vehicle carrier mounted to said housing for movement from a
first position in which the carrier is confined within said housing to function therewith as a carrying closure to a second position presenting an open end for launching said vehicle;
ready means on said top wall for actuating movement of said carrier from said first to said second launching position;
a launching device operatively connected to said carrier; and
firing means on said top wall for causing said launching device to propel said vehicle.

4,690,655

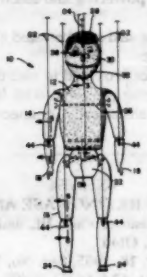
TALKING MARIONETTE WITH THEATRE

Samuel G. Bailey, 815 S. 18th St., Apt. 200, Arlington, Va. 22202

Filed Jul. 1, 1986, Ser. No. 880,994
Int. Cl.[4] A63J 19/00
U.S. Cl. 446—84 11 Claims

1. An amusement device comprising:
a marionette body suspended by a plurality of control lines, said control lines being attached at their lower ends to said body and one or more limbs, said control lines having upper ends disposed for use by an operator, said body being capable of suspension exclusive of any control line attached to a head of said body;
said head attached to said body at an upper torso, said head having a lower attached portion and an upper movable portion;
a head actuation line attached at a lower end to said upper movable portion, and having an upper end disposed for use by an operator;
pivot means connecting said upper movable portion to said lower attached portion, allowing said upper movable

portion to pivot about said lower attached portion when said head actuation line is raised and lowered; and



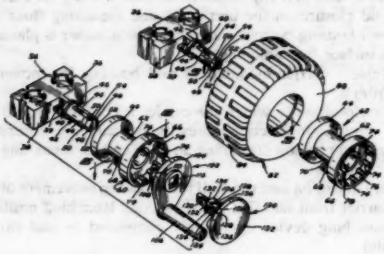
sound producing means disposed in said head, said sound producing means being in communication with an audio input signal source.

4,690,656

WHEEL AND WINCH ASSEMBLIES UTILIZING IDENTICAL HUBS AND AXLES IN A TOY CONSTRUCTION SET

Walter Friedman, Newbury, and David J. Stricker, Salem, both of Mass., assignors to Kenner Parker Toys, Inc., Beverly, Mass.

Filed Jun. 27, 1985, Ser. No. 749,258
Int. Cl.[4] A63H *17/00, 33/30, 17/26*
U.S. Cl. 446—95 **16 Claims**



1. In a toy construction set, a block, an axle projecting from one side of said block, said axle including a pair of legs formed by a slot therebetween, a spool-shaped hub journaled for rotation on said axle, means releasably engaging said legs to maintain said hub on said axle, and shiftable locking means having a tab movable into said slot to prevent rotation of said hub and movable out of said slot to permit rotation of said hub.

4,690,657

MAGNETICALLY ACTUATED AMUSEMENT DEVICE

Lawrence E. Lodrick, Sr., 2436 Harrison Ave., North, Rochester, Mich. 48063

Filed Jun. 3, 1985, Ser. No. 740,328
Int. Cl.[4] A63H *33/26;* **A63B** *71/00;* **A63F** *1/18*
U.S. Cl. 446—134 **9 Claims**

1. A magnetically cantilevered pendulously supported amusement device comprising:

a base;

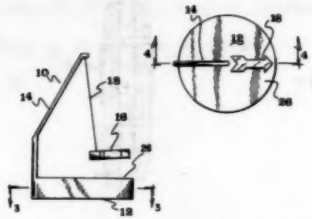
an enclosed chamber disposed within the base;

a first magnet having north and south poles on the opposite faces thereof contained within the enclosed chamber;

a second magnet having north and south poles on the opposite ends thereof, pendulously supported above the base at one end thereof;

wherein the polarity of the other, free end of the second magnet is the same as and repulses the polarity of the upper face of the first magnet and the strength of the repulsion between the first and second magnets is sufficient to at least balance the force of gravity acting to pull the free end of the second magnet down, thereby causing the free end to be cantilevered up and disposed at least as high as the supported end;

wherein the first magnet is capable of free lateral movement



within the enclosed chamber and is displaced therein in response to movement of the base, said displacement causing a change in position of the free end of the second magnet;

wherein the enclosed chamber contains means for permitting movably and randomly positioning of the first magnet; and

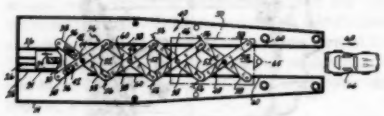
wherein the positioning means comprises at least one ring larger than the first magnet but smaller than the chamber such that the at least one ring can move freely and randomly within the chamber and the first magnet can move freely within the at least one ring.

4,690,658

TOY CAR LAUNCHER WITH EXPANDABLE SCISSORS MEMBERS

Peter Crosson, Torrance; Terry Sanchez, Lakewood; Kevin Gray, San Pedro, and Samuel M. Goldstein, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jul. 1, 1986, Ser. No. 880,775
Int. Cl.[4] A63H *29/00*
U.S. Cl. 446—429 **6 Claims**



1. A toy vehicle launcher, comprising:

a hollow body portion;

a plurality of scissors members operably coupled together to form an expandable parallelogram linkage, said scissors members slidably mounted inside said body portion;

a launching plate supported by said scissors members;

a sliding plate operably engaged to said scissors members and slidably mounted inside said body portion; and

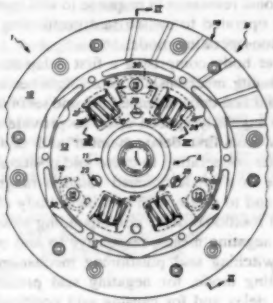
hand grip means connected to said body portion for moving said sliding plate in order to activate said expandable parallelogram linkage.

4,690,659

TORSIONAL DAMPER DEVICE

Aldo Marchisio, Moncalieri Turin, and Carlo Beccaris, Santena Turin, both of Italy, assignors to Valeo, Paris, France

Filed Apr. 24, 1985, Ser. No. 726,889
Claims priority, application France, Apr. 27, 1984, 84 06717
Int. Cl.[4] F16D 3/14, 13/64
U.S. Cl. 464—68 5 Claims



1. Torsional damper device comprising a first coaxial part in the form of a hub flange formed with circumferential slots, a second coaxial part in the form of two guide rings disposed one on each side of said hub flange and spacers passing through said slots and fastening said guide rings together, means for permitting relative angular movement between said first and second coaxial parts within predetermined limits of relative angular movement defined by abutment of said spacers with lateral edges of said slots, circumferentially acting elastic means disposed between said first and second coaxial parts along at least one circumference of the device urging them into an idle angular configuration and at least one elastic cushion member carried by one of said coaxial parts and operatively disposed circumferentially between one of said spacers and at least one of the lateral edges of the associated slot but off set from the zone of abutment of said one spacer with said at least one lateral edge to cushion elastically the abutment of said spacer against said edge, said at least one elastic cushion member being on said hub flange, there being a respective elastic cushion member associated with each slot in said hub flange, said elastic cushion member being an arch-shaped wire disposed in a plane parallel to the plane of said hub flange with each of its sides lying along a lateral edge of said slot.

4,690,660

DAMPER DISC

Yasuyuki Hashimoto, Katano, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jul. 22, 1985, Ser. No. 757,504
Claims priority, application Japan, Jul. 31, 1984, 59-162338
Int. Cl.[4] F16D 3/14, 47/02
U.S. Cl. 464—68 3 Claims

1. A damper disc comprising:

an annular flange having an inner peripheral portion and being connected at the inner peripheral portion to a torque output part;

a pair of annular side plates each having an outer peripheral portion, the side plates being connected at the outer peripheral portions thereof to a torque input part and arranged relatively twistably to said flange;

a pair of annular sub-plates arranged relatively twistably to said flange, and frictionally connected to the corresponding annular side plates during a soft torsion operation;

a first spring mechanism for the soft torsion operation disposed in first openings in the side plates, first openings in the sub-plates, and first openings in the flange for connecting the side plates to the flange;

said first spring mechanism for the soft torsion operation including:

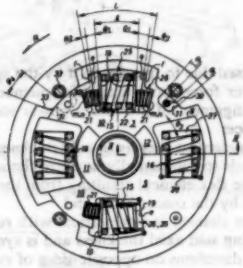
a pair of first springs,

a second spring disposed circumferentially between said first springs in series, and

a pair of engagement parts, each disposed at a corresponding end of said second spring and operable to engage with edges of said first openings;

said first opening in one of the flange and each side plate being designed to support both ends of the first spring mechanism for the soft torsion operation and to form a circumferential first space with respect to said engagement part in a neutral position,

the other of said first openings in the flange and each side plate being designed to support both ends of the first spring mechanism for the soft torsion operation and to form a circumferential second space longer than said first space with respect to the engagement parts in the neutral position; and



a second spring mechanism for a hard torsion operation disposed in second openings in the side plates and second openings in the flange for connecting the side plates to the flange;

wherein said second spring of said first spring mechanism for the soft torsion operation consists of a compressible coil spring of large diameter, said each first spring consists of a compressible coil spring of a diameter smaller than that of said second spring, said openings in the combination of the side plate and the sub-plate, and the openings in the flange for the first spring mechanism for the soft torsion operation have configurations nearly similar to that of the first spring mechanism for the soft torsion operation, and said each opening in the sub-plate and in the flange has a pair of side edges having circumferentially long length therebetween for supporting the ends of the first spring and a pair of side edges having a circumferentially short length therebetween and operable to support said engagement parts.

4,690,661

TORSIONAL STRESS DISTRIBUTION FLEXIBLE COUPLING

Walter A. Fredericks, and Edward W. McCullough, both of Warren, Pa., assignors to Rexnord Inc., Brookfield, Wis.

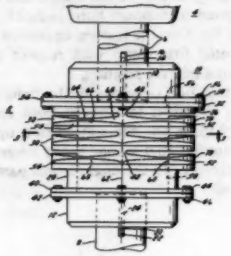
Filed Aug. 26, 1985, Ser. No. 769,237
Int. Cl.[4] F16D 3/52
U.S. Cl. 464—78 16 Claims

11. A flexible coupling connected between a rotary power source and a device driven by the power source and which may be out of alignment with the power source, the flexible coupling including two spaced apart transfer members for transmitting the rotary power comprising:

at least one flex element positioned between and spaced from

the transfer members, the flex element having an axis extending toward the transfer members, an axial thickness in the direction of the axis, and opposite sides facing in the axial direction;

a first plurality of spaced apart spacer links connected directly to one of the sides of the flex element and also connected to one of the transfer members, and a second plurality of spacer links connected directly to the other of the sides of the flex element and also connected to the other of the transfer members, the flex element being



stressed due to transfer to it by the spacer links of rotary power force from a transfer member and force due to misalignment of the rotary power source and the driven device;

the flex element varying in axial thickness peripherally about its axis to substantially equalize the stress concentrations in the flex element resulting from the stresses transferred to it by the spacer links; and

the flex element is symmetrical with respect to a plane bisecting said axial thickness and is symmetrical in peripheral directions on opposite sides of each spacer link.

4,690,662

SPEED CONTROL DEVICE

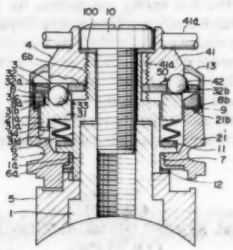
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 22, 1986, Ser. No. 888,161

Claims priority, application Japan, Jul. 29, 1985, 60-168295; Feb. 28, 1986, 61-44974

Int. Cl.[4] F16H *11/08*

U.S. Cl. 474—69 **7 Claims**



1. A speed control device for operating a derailleur which includes a return spring, said speed control device comprising:

a fixing member;

a lever body rotatably supported relative to said fixing member, said lever body for operating said derailleur;

a positioning mechanism including a positioning member rotatable with said lever body about said fixing member, said positioning member for setting speed change stages of said derailleur;

a switching mechanism including an operating member, said operating member for selectively switching said positioning mechanism between an operating mode and a non-operating mode;

a friction mechanism for applying to said lever body a rotational resistance overcoming said return spring of said derailleur in response to said operating member being operated to switch said positioning mechanism to said operating mode, said friction mechanism for releasing said rotational resistance in response to said operating member being operated to switch said positioning mechanism to said non-operating mode;

said lever body comprising a first delay member and said positioning mechanism comprising a second delay member, said first delay member and said second delay member being angularly spaced apart to provide a gap therebetween, said first delay member and said second delay member cooperating to cause said positioning mechanism to idle in a predetermined rotation range of said lever body and to rotate with said lever body after a predetermined rotational delay corresponding to said gap; and

a delay negating means, responsive to said operating member switching said positioning mechanism to said non-operating mode, for negating said predetermined rotational delay and for causing said positioning member to rotate in concert with said lever body without any rotational delay.

4,690,663

REAR DERAILLEUR FOR A BICYCLE

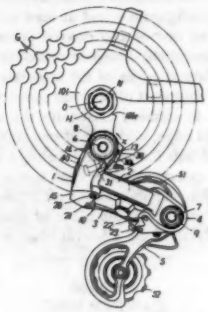
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 2, 1986, Ser. No. 869,610

Claims priority, application Japan, Jun. 17, 1985, 60-91403[U]

Int. Cl.[4] F16H *11/08*

U.S. Cl. 474—80 **5 Claims**



1. A rear derailleur for a bicycle, said derailleur being adapted to be mounted on a fixing member which is fixed to a frame of the bicycle and which has an abutting projection, said derailleur comprising:

a derailleur body including (i) a base member having a first stopper and (ii) a movable member;

a chain guide having a guide sprocket and a tension sprocket;

a first horizontal shaft to be fixed to said fixing member, for pivotably mounting said derailleur body on said fixing member;

a second horizontal shaft through which said chain guide is pivotably mounted on said movable member;

a stopper plate having a positioning nose adapted to be positioned opposite to said abutting projection and a second stopper to abut against said first stopper;

a first spring interposed between said base member and said stopper plate; and

a second spring interposed between said movable member and said chain guide;

said stopper plate including an adjusting means for changing the position of said positioning nose with respect to said abutting projection to thereby adjust a twist angle of said first spring.

4,690,664

TOOTHED BELT

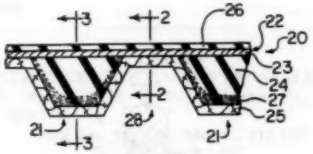
Robert E. Wetzel, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 508,209, Jun. 27, 1983, Pat. No. 4,533,420, and Ser. No. 378,978, May 17, 1982, Pat. No. 4,415,397, which is a division of Ser. No. 217,261, Dec. 16, 1980, Pat. No. 4,343,666, which is a continuation of Ser. No. 110,032, Jan. 7, 1980, abandoned, which is a division of Ser. No. 957,280, Nov. 2, 1978, Pat. No. 4,235,119. This application Apr. 22, 1985, Ser. No. 725,966

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.[4] F16G *1/28*

U.S. Cl. 474—205 **10 Claims**



1. In a belt construction having opposed sides and comprising a tensile means intermediate said opposed sides, said tensile means having opposed sides, a plurality of teeth defining one of said opposed sides of said belt construction and being mainly formed of a first polymeric material that has reinforcing fibers therein, each tooth having opposed sides that are disposed in spaced relation to adjacent sides of adjacent teeth, and a backing member defining the other of said opposed sides of said belt construction, said backing member being mainly formed from a second polymeric material that is initially separate from said material of said teeth and is substantially free of fibers therein, said material of said backing member having a surface that joins with a surface of each tooth whereby said joining surfaces define an interface line therebetween, the improvement wherein said interface line for each tooth extends from a point that is intermediate said opposed sides of said tensile means and is spaced inwardly from one of said opposed sides of the respective tooth into the medial portion of said respective tooth and then back to a point that is intermediate said opposed sides of said tensile means and is spaced inwardly from the other of said opposed sides of said respective tooth whereby part of said material of said backing member defines part of the medial portion of each tooth.

4,690,665

CHAIN BELT CONSTRUCTION, LOAD BLOCK THEREFOR AND METHODS FOR MAKING THE SAME

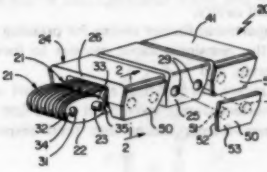
Larry R. Oliver, Springfield; James D. Hill, Jr., Marionville; Charles M. Lewis, Springfield; Gerald C. Hollaway, Jr., Springfield, and Jack Nelson, Springfield, all of Mo., assignors to Dayco Products, Inc., Dayton, Ohio

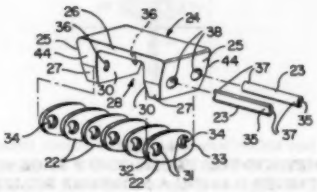
Filed Nov. 5, 1985, Ser. No. 795,070

Int. Cl.[4] F16G *5/18*

U.S. Cl. 474—245 **18 Claims**

1. In a chain belt construction comprising a plurality of interleaved sets of links, each set of links having transversely disposed pivot pin means joining its links to the links of the sets of links adjacent thereto, and a plurality of load block means respectively interconnected to certain of said sets of links to be carried thereby, the improvement wherein each said load block means has means defining tubular opening means therein that telescopically receive said pivot pin means of its respective set of links therein to interconnect that load block means to its





respective set of links, each said means that defines its respective opening means having a portion thereof that interlocks with its respective pivot pin means to prevent rotational movement therebetween.

4,690,666

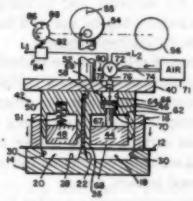
TRAY-FORMING APPARATUS

Garold W. Alexander, Noblesville; Lonnie E. Hyder, Huntington, both of Ind., and Robert V. Wright, Strongsville, Ohio, assignors to Peerless Machine & Tool Corporation, Marion, Ind. and Champion International Corporation, Stamford, Conn.

Filed Sep. 5, 1986, Ser. No. 903,961

Int. Cl.[4] B29C *51/20, 55/02*

U.S. Cl. 493—152 **23 Claims**



1. A die set for forming a multi-compartmented tray from sheet material, the die set comprising

a female die assembly formed to include at least two mold cavities and a drawing surface bounding said mold cavities and providing common drawing regions between adjacent mold cavities,

first compartment-former means for pressing sheet material into a selected mold cavity to form a compartment therein, the first compartment-former means including a first die for pre-forming the compartment, a second die for finish-forming the compartment, projection means for moving the first die relative to the second die in a direction toward the selected mold cavity from an initial position to a pre-forming position leading the second die into

the selected mold cavity during pre-forming of the compartment therein, and control means for disabling the projection means at a predetermined position of the first die in the selected mold cavity to permit relative movement between the leading first die and the trailing second die during finish-forming of the compartment in the selected mold cavity,

second compartment former means for pressing sheet material into the remaining mold cavities to form compartments therein, and

draw ring means for holding sheet material against said drawing surface during movement of the first and second compartment-former means into their respective mold cavities.

4,690,667

METHOD FOR PRODUCING A PACKAGING CONTAINER HAVING A PRESSURE RELIEF VALVE

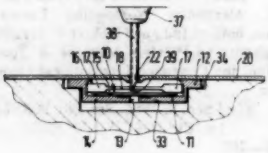
Klaus Domke, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,505

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526602

Int. Cl.[4] B31B *1/14, 1/90*

U.S. Cl. 493—213 **7 Claims**



1. A method for securing and forming a pressure release valve onto a packaging bag by use of a bag making apparatus which comprises:

forming a pressure release valve including a carrier having an inner bottom surface and a peripheral flange and including a central opening in the inner bottom surface;

said forming step including positioning a membrane on said inner bottom surface of the carrier and over the central opening and securing the membrane in the carrier at oppositely disposed surface areas,

positioning the pressure release valve in a recess of a support with the peripheral flange of the release valve supporting the carrier within said recess with the membrane above said inner bottom surface,

positioning a substantially gas impermeable packaging material to which the relief valve is to be secured over the carrier supported in the recess of the support,

securing the peripheral flange of the carrier to the packaging material, and

forming an opening through which gas can flow in the packaging material which coincides with the confines of the peripheral flange of said release valve and injecting a quantity of sealant through the formed opening onto said membrane which seals between said membrane and said carrier.

4,690,668

METHOD AND APPARATUS FOR MAKING A BUTT SEAM HAVING A COVER STRIP ON A TUBE OF MULTI-LAYER PACKAGING MATERIAL

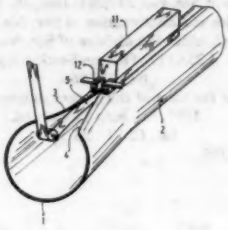
Manfred Rebmann, Weinstadt, and Helmut Weigold, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

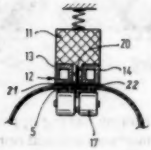
Filed Jun. 18, 1986, Ser. No. 875,898

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1985, 3536172

Int. Cl.[4] B31C *1/06*

U.S. Cl. 493—297 **3 Claims**





1. A method for making a butt seam on a multi-layered sheet of packaging material 1 having an inlay of metal and at least one outer layer of a thermoplastic which comprises forming said multi-layered sheet of packaging material into a tubular shape with substantially abutting longitudinal edges 3 and 4, positioning and guiding said formed tubular shape of material with its edges 3 and 4 juxtaposed a pair of fixed induction coils placed so that the edges 3 and 4 are adjacent to each other, extending a separating blade downward between said fixed pair of induction coils and between said edges 3 and 4, placing a thermoplastic cover strip 5 beneath said edges 3 and 4 pressing said cover strip onto an inner surface of said tubular shaped sheet of packaging material and welding said cover strip to said edges 3 and 4 by use of said pair of fixed induction coils placed juxtaposed said edges 3 and 4 of said formed tubular shaped packaging material as said tubular shaped sheet of packaging material and said cover strip travel continuously past said pair of fixed induction coils and are pressed together.

4,690,669

REFRIGERATED CENTRIFUGE HAVING A REMOVABLE BOWL

John F. Williams, New Canaan, and Emery L. Wagner, Norwalk, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 27, 1985, Ser. No. 802,303

Int. Cl.[4] B04B *15/02*

U.S. Cl. 494—14 **5 Claims**

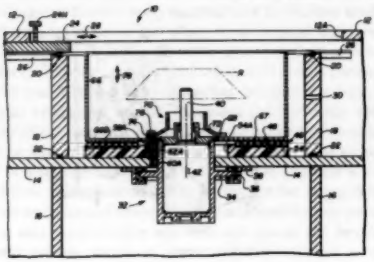
1. A centrifuge comprising:

a casing;

a drive member mounted within the casing, the drive member having a shaft mounted for rotational movement about an axis of rotation;

a refrigeration coil formed in a substantially planar array mounted within a casing;

a bowl mounted within the casing in thermal contact with the coil, the bowl being removable from the casing in a direction substantially parallel to the axis of rotation;



a thermally conductive material disposed between the bowl and the refrigeration coil; and

a formed plate of thermally insulated material corresponding in shape to the coil for supporting the coil within the casing.

4,690,670

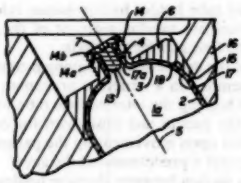
CENTRIFUGE TUBE HAVING REUSABLE SEAL

Steven T. Nielsen, 1126 W. Knickerbocker Dr., Sunnyvale, Calif. 94087

Filed Jan. 10, 1986, Ser. No. 818,524

Int. Cl.[4] B04B *5/02*

U.S. Cl. 494—16 **17 Claims**



1. A centrifuge tube and seal comprising:

a tube having a body portion for holding contents to be centrifuged and a partially enclosed upper end, said upper end terminating in a filler stem,

said stem having a central aperture and an exterior end annular sealing surface;

a support crown fitting over said filler stem for supporting at least a portion of said stem below said sealing surface; and

a screw plug screw inserted into said central aperture of said stem, said screw plug having a screw head undersurface compressing said stem annular sealing surface when said screw plug is sufficiently torqued into said central aperture.

4,690,671

LUBRICATED TAMPON INSERTER

Mary T. Coleman, 23 Mertensia La., Henrietta, N.Y. 14467, and Hedy E. Tasbas, 29 Northfield Gate, Pittsford, N.Y. 14534

Filed Oct. 15, 1985, Ser. No. 787,470

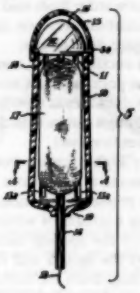
Int. Cl.[4] A61F *13/20*

U.S. Cl. 604—12 **14 Claims**

1. A device for placing an absorbent tampon into a body cavity comprising:

a. an applicator body comprising a tubular-like body within which said tampon is placed, said tubular-like body containing a plurality of conduits extending longitudinally along the inner side of said tubular-like body whereby fluid for medicating and or lubricating said tampon can be conducted down the side of said tubular-like body to and on to the other end of said tampon;

b. fluid reservoir means moveably and removeably attached to one end of said applicator body; and



c. movement means, moveably secured within said applicator body and at the end opposite said fluid reservoir, sized and shaped to fit within said applicator body, wherein said movement means can move the tampon out of the applicator body when the device is used,

whereby when said device is placed within said body cavity said treated tampon can be moved into said body cavity.

4,690,672

APPARATUS FOR REMOVING SOLID STRUCTURES FROM BODY PASSAGES

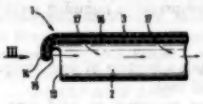
Elmar M. Veltrup, Hermann-Schumacher-Str. 16a, 4150 Krefeld 1, Fed. Rep. of Germany

Continuation of Ser. No. 768,025, Aug. 21, 1985, abandoned. This application Oct. 21, 1986, Ser. No. 921,872

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1984, 8426270[U]

Int. Cl.[4] A61M *3/00*

U.S. Cl. 604—43 **1 Claim**



1. An apparatus for the removal of a solid structure from a passage in a body of a patient, said apparatus comprising:

a flexible dual duct catheter having distal and proximal ends adapted to be inserted into said passage and formed with

a flexible suction duct means having an outer portion opening at an open mouth at the distal end of said catheter placed in fluid communication with the passage in the patient's body and of substantially uniform flow cross-section between the proximal and distal ends of said suction duct means,

a flexible positive pressure duct means extending substantially along said outer portion of said suction duct means and terminating and extending distally of said mouth of said suction duct means and having a nozzle with an opening means to direct fluid in a direction opposite to the direction of flow in said positive pressure duct means into

said open mouth at the distal end of said suction duct means, the positive pressure duct means being of substantially smaller flow cross section than the suction duct means, and

a flexible wall extending along, unitary with and separating said suction duct means and pressure duct means laterally from each other, the wall adjacent said open mouth having a row of orifices extending longitudinally in the wall rearwardly from said open mouth providing fluid communication between said suction duct means and said pressure duct means;

means including a suction pump connected to said suction duct means at the porximal duct means end thereof remote from the suction-duct means mouth for aspirating material into and back through the suction duct means in an inward particle-flow direction; and

means including a high-pressure pump connected to said pressure duct means remote from the nozzle thereof for pressurizing the pressure duct means and thereby simultaneously directing a stream of water from the nozzle back into the mouth of the suction duct means to break up a solid structure at the mouth and for directing respective streams of said fluid from the orifices back into said suction duct means in the particle flow direction.

4,690,673

DUAL MODE I.V. INFUSION DEVICE WITH DISTAL SENSOR

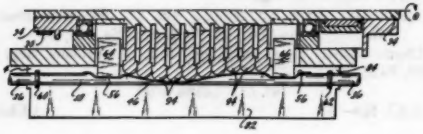
Ted C. Bloomquist, San Diego, Calif., assignor to IMED Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 801,987, Nov. 26, 1985, Pat. No. 4,617,014. This application Mar. 26, 1986, Ser. No. 844,414

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—67 **20 Claims**



1. A device for pumping fluids from a fluid source through a tube having a compressible pumping section, which device comprises:

a case;

means for holding a portion of said compressible pumping section on said case;

peristaltic means mounted on said case and operatively engaged with said tube to sequentially squeeze said pumping section and produce at least one moving zone of occlusion along said pumping section for infusing fluids to the patient;

a gauge fixedly mounted on said case and operatively coupled with said pumping section, at a predetermined location thereon, for sensing fluid pressure in said pumping section at said location at a first time when said I.V. tube downstream from said location is patent and at a second time when said I.V. tube upstream from said location is patent;

a first stationary finger disposed upstream from and adjacent to said gauge;

a second stationary finger disposed downstream from and adjacent to said gauge;

means to determine a pressure differential between said first time and said second time; and

means to alarm and cease operation of said device when said pressure differential attains a predetermined value.

4,690,674

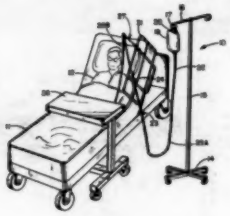
INTRAVENOUS TUBE ASSEMBLY

Herbert F. Dalglish, 284 Cherokee Ave., St. Paul, Minn. 55107

Filed May 12, 1986, Ser. No. 861,979

Int. Cl.[4] A61M *27/00*

U.S. Cl. 604—93 **20 Claims**



1. An intravenous tube assembly for providing fluid intravenously to a patient, comprising:

a stand having an elongate vertical column supported on a pedestal base at a lower end thereof and having a hanger member at the upper end thereof;

an intravenous fluid container comprised as a flexible pouch suspended from the hanger member of the stand for containing a supply of intravenous fluid;

intravenous fluid tubing, having a first end operatively connected to the fluid container, and a second end connectable to a patient for intravenous receipt of fluid by the patient;

a mast assembly having an elongate, resiliently deflectable mast, a base, said mast having a fixed end secured to the base and a movable tip deflectable with respect to the base, and a tube holder located on the movable tip of the mast, said tube holder having means releasably retaining an intermediate tubular segment of the fluid tubing between the first and second ends;

said base of the mast assembly having means for securing the mast assembly on a structure proximate the patient with the mast holding the intermediate tube segment out of the way of the patient and positioned for deflection toward the patient upon movement by the patient away from the mast beyond a predetermined distance;

said tubing section between the tube holder on the mast and the second end being a measured length to extend from the top of the undeflected mast to the normal relaxed position of the patient with some residual tubing to accommodate limited normal patient movement before deflection of the mast upon additional movement in a direction away from the mast.

4,690,675

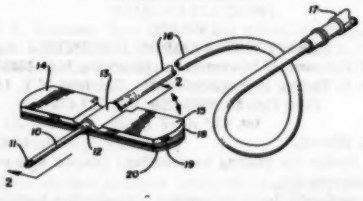
INTRAVENOUS NEEDLE ASSEMBLY

William Katz, 550 Parmalee Ave., Youngstown, Ohio 44510

Continuation-in-part of Ser. No. 672,926, Nov. 19, 1984, Pat. No. 4,627,842. This application Jun. 11, 1986, Ser. No. 872,867

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—177 **3 Claims**



1. An improvement in an intravenous needle assembly hav-

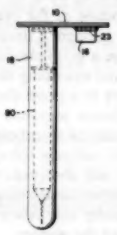
ing an elongated flexible body member with upper and lower surfaces with a central section and oppositely extending wing sections with respect thereto, and a hollow needle having a beveled end positioned through said central section transversely of said elongated flexible body member on a transverse horizontal plane; the improvement comprising means for tilting said elongated flexible body member and the hollow needle from said transverse horizontal plane to an angular transverse plane with respect to said transverse horizontal plane when said assembly is applied to a patient's skin, said means comprising at least one longitudinally extending transversely tapered resilient pad positioned on said elongated flexible body member in oppositely disposed relation to said central section and said hollow needle so that when said hollow needle of said assembly is positioned through a patient's skin and into a vein of said patient, said tapered flexible body member engages the patient'skin and tilts said central section and said hollow needle relative to said patient's skin and vein and spaces the beveled end of said hollow needle in unencumbered relation to the walls of said vein.

4,690,676

METHOD OF OPENING A MEDICINE PACKAGE

Thomas S. Moulding, Jr., 1954 Glencoe St., Denver, Colo. 80220, and Donald G. Ellis, Geneva Park, Boulder, Colo. 80302

Division of Ser. No. 532,038, Sep. 14, 1983, Pat. No. 4,604,847. This application Jun. 10, 1986, Ser. No. 872,482
Int. Cl.[4] G09F *30/00*
U.S. Cl. 604—189 **25 Claims**



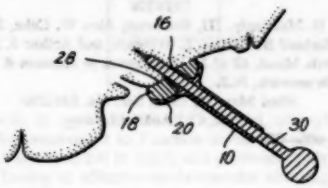
1. A method of dispensing medicine to a person comprising the steps of:
   (a) providing a package of medicine provided with a code indicating information concerning the characteristics of the medicine;
   (b) providing a machine having means for identifying the medical needs of the person and for determining whether the dispensing of the medicine to the person will help satisfy the medical needs of the person, means for reading the code and transmitting the information indicated by the code to said identifying and determining means, means for rendering the code unreadable only when said identifying and determining means determines that the medicine in the package will help satisfy the medical needs of the person, and means for opening the package only when said identifying and determining means determines that the medicine in the package will help satisfy the medical needs of the person;
   (c) reading the code by the reading and transmitting means;
   (d) rendering the code unreadable by the rendering means;
   (e) opening the package by the opening means; and
   (f) delivering the medicine to the person.

4,690,677

URINE COLLECTION SYSTEM FOR FEMALES

Robert A. Erb, Valley Forge, Pa., assignor to Daltex Medical Sciences, Inc., West Orange, N.J.

Filed Sep. 25, 1985, Ser. No. 780,056
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—329 **25 Claims**



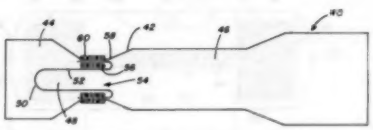
1. An enclosed, self-contained female urine collection system which can be worn for extended periods of time and which avoids the necessity for catheterization, whereby transurethral transport of micro-organisms are avoided, or minimized, said system comprised of in combination:
   (a) a flexible conduit for conducting urine from the urethral ostium to a urine collection and storage zone, said conduit having an internal diameter essentially the same as the urethra, and said conduit having disposed therein a movable, urethral positioning member whereby said conduit can be axially aligned with said urethral ostium,
   (b) a support member affixed to and circumferentially encompassing one end of said conduit and having disposed thereon a pliable, adhesive sealing medium whereby the lumen of said conduit can be sealably positioned in alignment with the ostium of said urethra using said urethral positioning member and whereby said conduit does not penetrate said urethra, but is maintained in a leak-free relationship therewith so that urine can flow from said urethral ostium through said conduit to said collection and storage zone, and
   (c) said urine collection and storage zone located at a point on said conduit distant from said urethral ostium.

4,690,678

DEVICE AND METHOD FOR FACILITATING ANIMAL ARTIFICIAL INSEMINATION

Margaret M. Douglas-Hamilton, Beverly, Mass., assignor to 501 Hamilton/Thorn Research Associates, Wenham, Mass.

Continuation-in-part of Ser. No. 588,681, Mar. 12, 1984, abandoned. This application Jun. 24, 1985, Ser. No. 747,912
Int. Cl.[4] A61F *5/00*
U.S. Cl. 604—349 **5 Claims**



1. A one-piece disposable artificial vagina liner and collection receptacle comprising:
   a continuous flexible sheet defining
   a generally tubular main portion having a first and a second end portion,
   said first end portion defining an intromission opening,
   said second end portion defining a closed, integral collection chamber, and
   a filter means located within said liner intermediate said

main portion and said collection chamber and secured to said sheet,

said first end portion and said second end portion, and the area disposed therebetween being constructed of the same material and having the same degree of flexiblity.

4,690,679

COEXTRUDED APERTURED FILM SANITARY NAPKIN COVER

William B. Mattingly, III, Somerset; Alex W. Cabe, Jr., Lebanon; Richard B. Chapas, E. Windsor, and Arthur J. Sampson, Jr., Belle Mead, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 14, 1986, Ser. No. 840,290
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—383 22 Claims

1. An absorbent product, including a body of absorbent material covered by a cover of polymeric materials, said cover comprising:

a first layer of polymeric material which exhibits a first melting point temperature;

a second layer of polymeric material, bonded to said first layer, said second layer exhibiting a second melting point temperature which is less than said first melting point temperature; and

a plurality of apertures, penetrating through both said first layer and said second layer for the transmission of fluids through said cover,

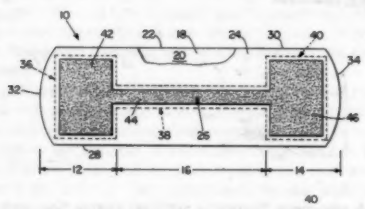
wherein said first layer maintains the integrity of said apertured cover when said cover is heated to a temperature below said first melting point temperature for thermal bonding of said cover.

4,690,680

ADHESIVE ATTACHMENT MEANS FOR ABSORBENT ARTICLES

Maureen L. Higgins, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 27, 1986, Ser. No. 879,677
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—386 20 Claims



1. An absorbent article designed to be worn in the crotch region of a garment, the absorbent article having a central region, a first end region and a second end region, the absorbent article comprising:

an absorbent core;

a backsheet associated with said absorbent core; and

adhesive attachment means disposed on said backsheet for securing the absorbent article to a garment, said adhesive attachment means consisting of an adhesive pattern having the shape of a block I having

a base adhesive portion located in said first end region of the absorbent article,

a stem adhesive portion centrally located in said central region of the absorbent article, and

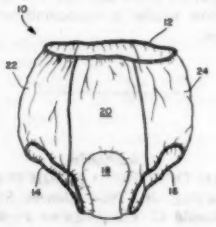
a head adhesive portion located in said second end region of the absorbent article.

4,690,681

DISPOSABLE LEAKPROOF CATAMENIAL DEVICE

Susan M. Haunschild, Neenah; Stephen S. Hata, Menasha, and Shirlee A. Wismer, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 23, 1986, Ser. No. 821,631
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—396 17 Claims



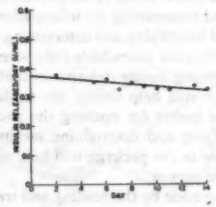
1. A disposable undergarment for absorption of human exudate comprising a panty-like garment having an elastic waist, elasticized legs, an absorbent integral with said undergarment extending from at least about the top of the pubic region through the crotch and upward to at least about the point between the upper portion of the crack between the gluteus maximus wherein said garment is provided with an impervious portion extending from a point above the pubic region in the front of the garment and extending through the crotch region and upward in the back to a point above the upper end of the crack between the gluteus maximus of the wearer, wherein there is a greater amount of absorbent in the back of the garment than in the front, wherein the elastic of said elasticized legs is separated from said absorbent by flexible nonabsorbent flaps between the absorbent and said elastic of said elasticized legs and wherein stretchy side fabrics cause said garment to conform to the body of the wearer.

4,690,682

SUSTAINED RELEASE

Franklin Lim, Richmond, Va., assignor to Damon Biotech, Inc., Needham Heights, Mass.

Continuation of Ser. No. 485,471, Apr. 15, 1983, abandoned.
This application Jan. 14, 1986, Ser. No. 819,979
Int. Cl.[4] A61K *9/22*
U.S. Cl. 604—891 17 Claims



1. An injectable dispensing system for releasing a substance at a substantially constant rate in an environment immediately

adjacent said dispensing system that depletes said substance, said system comprising:

a microcapsule having a membrane comprising a matrix of polycationic polymer salt bonded to a polyanionic polymer which defines an intracapsular volume, said membrane having a multiplicity of pores of dimensions sufficient to limit the rate at which the molecules of said substance pass therethrough from said intracapsular volume; and

disposed within said volume, for purposes of maintaining a given extracapsular concentration in said environment, a concentration of aid substance at least two orders of magnitude greater than said given extracapsular concentration which results in an osmotic pressure sufficient to sustain said limited rate when said capsule is placed in said environment.

4,690,683

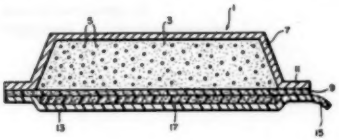
TRANSDERMAL VARAPAMIL DELIVERY DEVICE

Yie W. Chien, North Brunswick, and Kakuji Tojo, Highland Park, both of N.J., assignors to Rutgers, the State University of New Jersey, New Brunswick, N.J.

Filed Jul. 2, 1985, Ser. No. 751,126

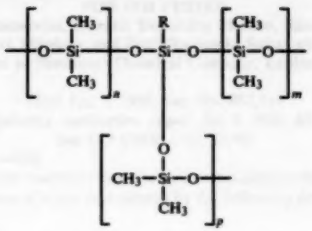
Int. Cl.[4] A61K *9/00*

U.S. Cl. 604—896 **29 Claims**



1. A transdermal drug delivery device comprising:

a permeable polymer matrix comprising a silicone elastomer corresponding to the formula:



wherein R represents an alkoxy, alkyl, alkenyl or aryl group containing 1 to 7 carbon atoms and wherein n, m and p are each 100 to 5,000; said permeable polymer matrix having an effective cardiovascular affecting amount of 5-[-(3,4-dimethoxyphenyl) methylamino]-2-(3,4-dimethoxyphenly)-2-isopropylvaleronitrile and an effective release promoting amount of a first transport enhancing agent dispersed therein, and

a bioacceptable adhesive layer covering one face of said polymer matrix, said adhesive having an effective drug transport promoting amount of a second transport enhancing agent dispersed therein;

wherein said second agent is different from said first agent.

4,690,684

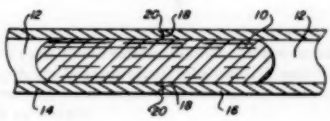
MELTABLE STENT FOR ANASTOMOSIS

Francis T. McGreevy, Aurora, and Karl W. Hahn, Englewood, both of Colo., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jul. 12, 1985, Ser. No. 754,472

Int. Cl.[4] A61F *2/04;* A61B *17/04*

U.S. Cl. 623—12 **17 Claims**



1. A stent for insertion into the interior of the ends of a tubular vessel in a living being to align the ends of the vessel and support the vessel during anastomosis, comprising an integral solid of a biological fluid material adapted to melt into a fluid which is biologically compatible and naturally integrable with that fluid which normally flows through the vessel, said stent having a predetermined temperature substantially less than the temperature of the vessel upon insertion into the vessel.

4,690,685

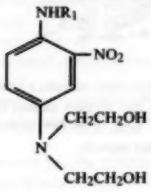
DYEING COMPOSITION FOR KERATINOUS FIBRES CONTAINING AT LEAST ONE CO-SOLUBILIZED N-SUBSTITUTED 2-NITRO-PARA-PHENYLENEDIAMINE

Jean-Francois Grollier, Paris; Jean Cotteret, Franconville; Alex Junino, Aulnay, and Alain Genet, Neuilly Plaisance, all of France, assignors to L'Oreal, Paris, France

Filed Sep. 26, 1985, Ser. No. 780,606
Claims priority, application Luxembourg, Sep. 27, 1984, 85557
Int. Cl.[4] A61K 7/13
U.S. Cl. 8—405 16 Claims

1. A hair dye composition for living human hair comprising a solution in water, as a cosmetically acceptable vehicle, of (1) a paraphenylene diamine selected from the group consisting of

(a) a 2-nitroparaphenylene diamine of the formula



(I)

wherein

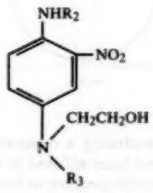
R_1 represents alkyl having 1-3 carbon atoms or β-hydroxyalkyl and

(b) an inorganic or organic salt of the 2-nitro paraphenylene diamine defined in (a),

said paraphenylene diamine being present in an amount ranging from 0.05 to 10 percent by weight, expressed as free based, based on the total weight of said composition, and

(2) a co-solubilizing amount of a compound selected from the group consisting of

(c) a compound having the formula



wherein

R_2 represents hydroxyalkyl wherein the alkyl moiety has 2-3 carbon atoms; and

R_3 represents ω-hydroxyalkyl wherein the alkyl moiety has 2-3 carbon atoms, with the proviso that when $R_3 = CH_2CH_2OH$, R_2 does not represent β-hydroxyethyl, and

(d) an inorganic or organic salt of the compound defined in (c),

said compound of (2) being present in an amount ranging from 0.1 to 10 percent by weight, expressed as free base, based on the total weight of said composition.

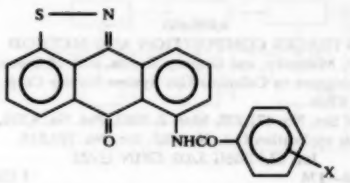
4,690,686

LIGHT-FAST YELLOW DISPERSE DYE COMPOSITION FOR POLYESTER

Toshio Nakamatsu, Ibaraki; Yoshikazu Matsuo, Sakai; Masao Nishikuri, Hirakata, and Kunihiko Imada, Sakai, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

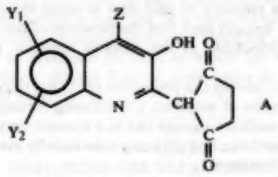
Filed Jul. 7, 1986, Ser. No. 882,714
Claims priority, application Japan, Jul. 9, 1985, 60-151035
Int. Cl.[4] C09B 1/00, 29/00
U.S. Cl. 8—638 5 Claims

1. A water-insoluble disperse dye composition comprising a combination of a dye represented by the following formula (I),



(I)

wherein X is hydrogen, halogen, C_1-C_4 alkyl or C_1-C_4 alkoxy, in an amount of 95 to 20% by weight, and a dye represented by the following formula (II),



(II)

wherein Z, Y_1 and Y_2 are independently hydrogen or halogen, and the ring A is a benzene or naphthalene ring unsubstituted or substituted with a carboxylic acid ester group, in an amount of 5 to 80% by weight.

4,690,687

FUEL PRODUCTS COMPRISING A LEAD SCAVENGER

Thomas E. Johnston, Mentor, and Casper J. Dorer, Jr., Lyndhurst, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 766,615, Aug. 16, 1985. This application May 14, 1986, Ser. No. 863,623
Int. Cl.[4] C10L 1/30
U.S. Cl. 44—67 75 Claims

1. An unleaded fuel composition for an internal combustion engine comprising a major portion of a liquid hydrocarbon fuel and a minor amount of:

(a) a hydrocarbon soluble alkali metal or alkaline earth metal containing composition; and

(b) a lead scavenger.

4,690,688

FOAM CONTROL

Graham Adams, Brussels, Belgium, and Martin A. Jones, S. Glamorgan, Wales, assignors to Dow Corning, Ltd., Barry, Wales

Filed Feb. 24, 1986, Ser. No. 831,954
Claims priority, application United Kingdom, Mar. 29, 1985, 8508254; Jan. 30, 1986, 8602234
Int. Cl.[4] C10L 1/28
U.S. Cl. 44—76 8 Claims

1. A method for controlling foaming of a liquid hydrocarbon

fuel comprising the inclusion in the hydrcarbon fuel of an antifoam agent consisting essentially of a siloxane copolymer having the average general formula

$$Me_3SiO(Me_2SiO)_x(MeR'SiO)_ySiMe_3$$

wherein Me represents a methyl radical, R' represents the group $Q(OCH_2CH_2)_nOZ$ in which Q represents an alkylene group having from 2 to 8 carbon atoms, n is 5 to 25 and Z represents hydrogen or a group OCR'' in which R'' denotes a monovalent hydrocarbon group, and wherein the ratio of x:y is in the range of 1:1 to 9:1.

5. A hydrocarbon fuel treated by a method according to claim 1.

4,690,689

GAS TRACER COMPOSITION AND METHOD

Norman D. Malcosky, and Gregory Koziar, both of Columbus, Ohio, assignors to Columbia Gas System Service Corp., Columbus, Ohio

Division of Ser. No. 471,278, Mar. 2, 1983, Pat. No. 4,551,154. This application Oct. 24, 1985, Ser. No. 790,814

Int. Cl.[4] B65G *5/00*; G01N *33/22*

U.S. Cl. 48—174 **7 Claims**

1. A process for determining whether any of a plurality of porous underground gaseous methane storage sites is in fluid communication with a gas producing well, and if there is fluid communication, determining which site is in said fluid communication comprising injecting a different gaseous tracer mixture into each of a plurality of said sites at some location in each said site in an amount such that the presence of the tracer mixture will be detectable in the gaseous methane stored therein,

each said mixture having the properties of (1) not occurring in natural supplies of methane, (2) diffusing through any underground methane storage site in a manner very similar in rate to methane, and (3) being substantially insoluble in petroleum distillates,

after a period of time sufficient for each of said tracer mixtures to diffuse through the underground site from its injection location to the well, withdrawing a sample gaseous product from said well,

testing said sample gaseous product for the presence of each of said tracer mixtures.

4,690,690

STEAM REFORMING HYDROCARBONS

Sydney P. Andrew, Hartlepool; Ralph J. Doy, Saltburn-by-the-Sea, and Antony P. J. Limbach, Stockton-on-Tees, all of England, assignors to Imperial Chemical Industries plc, London, England

Filed Feb. 24, 1986, Ser. No. 832,425

Claims priority, application United Kingdom, Mar. 5, 1985, 8505684; Aug. 21, 1985, 8520890; Aug. 21, 1985, 8520891; Aug. 25, 1985, 8518824

Int. Cl.[4] C01B *3/38*

U.S. Cl. 48—214 A **12 Claims**

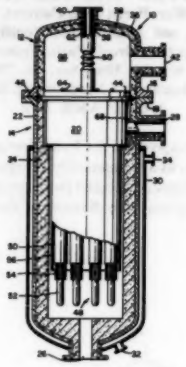
1. A process for producing a product gas stream containing hydrogen, carbon oxides, and methane by incomplete catalytic reaction of a hydrocarbon feedstock with steam and/or carbon dioxide comprising:

passing a reactants stream containing a hydrocarbon feedstock steam and/or carbon dioxide over a catalyst disposed in an elongated zone having an inlet end and an outlet end, said elongated zone being defined by an outer wall and a wall of a tube, disposed within the outer wall and extending from the outlet end of the elongated zone to the inlet end thereof;

externally heating said elongated zone with a heating medium;

withdrawing a product gas stream containing hydrogen, carbon oxides and methane through said tube countercurrently to the flow of said reactants stream over the catalyst; and

cooling the product gas stream by at most 100° C. by heat



exchange with the reactants stream across the wall of said tube as the product gas stream passes through said tube thereby improving heat transfer between the heating medium and reactants stream.

4,690,691

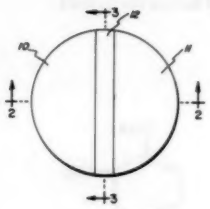
POLYCRYSTALLINE DIAMOND AND CBN CUTTING TOOLS

Ranga Komanduri, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,414

Int. Cl.[4] B24D *3/00*

U.S. Cl. 51—293 **26 Claims**



1. A process for producing a composite of a partitioned polycrystalline diamond layer adhered to a substrate structure wherein said layer is partitioned into at least two discrete areas by a substantially straight partitioning part of said substrate structure, which comprises forming a supporting structure comprised of a substrate with at least one substantially straight partition on its surface, said partition dividing said support surface forming therewith at least two discrete support areas, said supporting structure being comprised of polycrystalline metal carbide containing a metallic cementing agent, substantially filling said support areas with crystals of diamond, heating the resulting assembly under an applied pressure to a temperature above the melting point of said metallic cementing agent but below a temperature which has any significant deleterious effect on said assembly for a period of time sufficient to form said composite and recovering said composite.

4,690,692

SYNTHETIC RESIN BINDERS AND THEIR USE FOR THE MANUFACTURE OF ABRASIVES

Wolfgang Hesse, Breckenheim; Richard Settelmeyer, Schlangenbad-Georgenborn, and Eckart Teschner, Hünstetten-Limbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 141,000, Apr. 17, 1980, abandoned, which is a continuation of Ser. No. 936,833, Aug. 25, 1978, Pat. No. 4,251,408. This application Jun. 22, 1984, Ser. No. 623,616

Int. Cl.[4] B24D *3/02*

U.S. Cl. 51—293 14 Claims

1. A process for producing a flexible abrasive article comprising in sequence the steps of:

A. applying on a flexible substrate a first layer of a binder comprising a resinous component;

B. distributing abrasive particles in the first layer to form a particle embedded layer;

C. drying the first layer;

D. applying a second layer of a binder comprising a resinous component to the particle embedded layer to form a composite structure;

E. drying the second layer;

F. heating the composite structure to cure the first layer and the second layer;

wherein the resinous component of the binders used in steps A and D consists essentially of Component I and Component II;

wherein Component I is the reaction product of a monohydric phenol and formaldehyde in the molar ratio of 1:1.1 to 1:2.2; and

wherein Component II is a co-condensate of (a) a monohydric phenol, (b) a polyhydric phenol and (c) formaldehyde; wherein the molar ratio of a:c is from 1:1.1 to 1:1.9; wherein the molar ratio of a:b is from 1:0.1 to 1:2.0; wherein the molar ratio of (a+b):c is from 1:0.6 to 1:1.5; and

wherein the weight ratio of I:II is at least 70:30 and at most 95:5; with the proviso that in the resinous component the total amount of the polyhydric phenol is equal to or less than it is in a resinous component derived from Component I and Component II in a mixing ratio of 70:30 by weight; and wherein Component II has a molar ratio of 1.5 moles of polyhydric phenol to one mole of monohydric phenol.

4,690,693

HIGH PURITY SILICON NITRIDE POLISHING COMPOUND

Robert J. Dobbs, Monroeton, Pa., and Shuford M. Alexander, Jr., Dallas, Tex., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 5, 1985, Ser. No. 804,724

Int. Cl.[4] C04B *35/64*

U.S. Cl. 51—307 4 Claims

1. A polishing compound of relatively high purity silicon nitride, said silicon nitride comprising particles having essentially equiaxial crystals, the particle size being from about 0.03 microns to about 5 microns.

4,690,694

METHOD OF AUTOMATICALLY CONTROLLING AN ELECTROSTATIC PRECIPITATOR

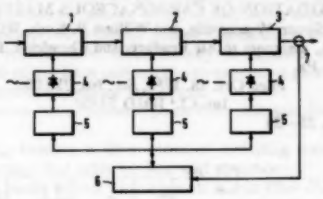
Franz Alig, Johannesberg; Heinrich Böcker, Gründau; Franz Neulinger, Erzhausen, and Helmut Schummer, Heusenstamm, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 881,882

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3526009

Int. Cl.[4] B03C *3/68*

U.S. Cl. 55—4 12 Claims



1. A method of optimizing the supply of energy to an electrostatic precipitator and avoiding a reverse corona discharge in such precipitator, comprising the steps of: energizing the precipitator in cycles, each of which comprising a pulsing time, in which at least one charging pulse is applied, and a non-pulsing time having a duration of a plurality of pulses, and iteratively changing parameters of the charging pulses in successive cycles to maximize the time in which the voltage across the precipitator decays from a peak value to a predetermined residual voltage.

4,690,695

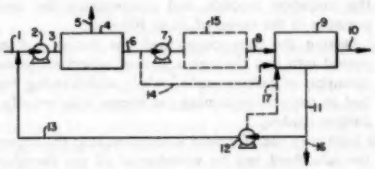
ENHANCED GAS SEPARATION PROCESS

Kishore J. Doshi, Mahopac, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 10, 1986, Ser. No. 850,045

Int. Cl.[4] B01D *53/04, 53/22*

U.S. Cl. 55—16 30 Claims



1. A process for the enhanced separation of gases comprising:

(a) contacting a feed gas stream at an elevated pressure with a permeable membrane capable of selectively permeating a first component thereof, thereby obtaining a first component enriched, second component depleted permeate portion of said feed stream at a reduced pressure, and a second component enriched, first component depleted non-permeate portion of said feed stream essentially at said elevated pressure;

(b) withdrawing said non-permeate gas from the permeable membrane;

(c) passing said permeate gas to a feed end of an adsorbent bed in a pressure swing adsorption system capable of selectively adsorbing additional amounts of said second component therefrom at an upper adsorption pressure, with unadsorbed, purified first component gas being withdrawn as a high purity gas from a product end of the bed;

(d) countercurrently depressurizing the bed to a lower desorption pressure and/or purging said bed to desorb and release a first and second component-containing regeneration stream from the feed end of the bed; and

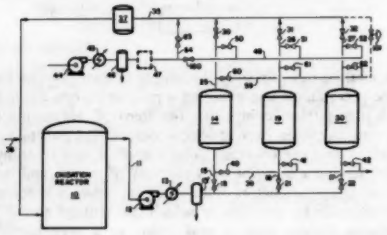
(e) recycling at least a first portion of said regeneration stream for combination with additional quantities of the feed gas stream, whereby the separation of the first component is achieved at a high purity and desirable recovery levels, with said second component being available at a desirably high pressure level.

4,690,696

OXIDATION OF CARBONACEOUS MATERIAL

Shivaji Sircar, Wescosville, and William R. Koch, William, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 18, 1985, Ser. No. 789,002
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—26 7 Claims



1. In the oxidation of biological or other organic substances with an oxygen-rich gas stream containing 25 to 80 volume percent O_2, wherein there is evolved a gaseous effluent containing one or more oxides of carbon and unreacted oxygen, and wherein said effluent is freed of oxides of carbon by selective adsorption and the resulting CO_2-freed gas residue is recycled for use in said oxidation, the method which comprises the steps of:

(a) discharging the CO_2-containing gaseous effluent from the oxidation reaction and compressing the same to a pressure in the range of 30 to 100 psig;

(b) passing the thus-compressed gas during a fixed time period into and through a bed of adsorbent selective in retention of carbon oxides, while withdrawing from said bed an oxygen-containing gas stream substantially free of carbon oxides;

(c) following the aforesaid adsorption step (b) depressuring the adsorbent bed by withdrawal of gas therefrom in a direction counter to that of the adsorption step, until the pressure in said bed drops to about ambient atmospheric level;

(d) while at about ambient atmospheric pressure, purging the bed by passing air therethrough in a direction counter to that of the adsorption step, to remove sorbed oxides of carbon therefrom;

(e) and thereafter repressuring the purged bed to adsorption pressure by introduction therein of part of the oxygen-containing gas withdrawn during step (b);

wherein said steps (b) through (e) are carried out in a sequentially operated plurality of adsorbent beds wherein:

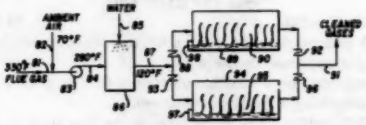
during the fixed time period that one bed is undergoing step (b), a second bed which has theretofore completed step (b) is subjected during the initial part of that time period to depressuring by gas withdrawal and during the remainder of that fixed time period said second bed is being purged, while during that same fixed time period, a third previously purged bed is being repressured to adsorption pressure level.

4,690,697

LONG RESIDENCE POLLUTION CONTROL SYSTEM

Arthur G. Schwartz, 1119 Smyrna Ct., Sunnyvale, Calif. 94087; Richard M. Gurries, 19314 Vineyard Ln., Saratoga, Calif. 95070, and Jay K. Johnson, P.O. Box 137, La Honda, Calif. 97020

Filed Feb. 20, 1986, Ser. No. 831,295
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—84 12 Claims



1. A process utilizing growing plants to remove noxious components from gaseous streams comprising the steps of:

providing a plurality of enclosures, each of which includes growing plants for removing noxious components from said influent gas stream prior to discharge;

providing inlet and outlet means associated with each enclosure for introducing said gaseous stream being purified and for discharging said purified gaseous stream to the atmosphere;

providing damper means for periodically swiching from one of said enclosures to another of said enclosures;

introducing said influent gas stream into a first enclosure through said damper means;

contacting said influent gas stream with said growing plants for a sufficient time to remove the noxious components in said gas stream and concomitantly permitting the plants to grow to a size where it can be harvested;

discharging said purified gas stream to the atmosphere;

switching said influent gas stream to a next enclosure, harvesting said grown plants from said first enclosure, and replacing said removed grown plants with smaller ones; and

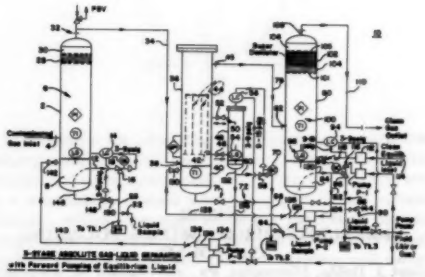
repeating the cycle.

4,690,698

ABSOLUTE SEPARATOR

Laurance S. Reid, 601 Broad La., Norman, Okla. 73069

Filed Jun. 25, 1986, Ser. No. 878,370
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—89 16 Claims



1. A method of continuously removing entrained liquid toxic contaminants from a gas stream comprising:

directing said liquid contaminated gas stream sequentially through a plurality of increasingly efficient gas-liquid separator vessels, each of said separator vessels containing a level of contaminant compatible solvent therein;

coalescing the liquid contaminant from said gas stream in said separator vessels into collectable droplets such that

said droplets form part of said solvent in said separator vessels;

maintaining said solvent in each separator vessel in a greater than equilibrium amount disposed in direct contact with said gas stream in each of said gas-liquid separator vessels such that said coalesced liquid contaminant easily becomes part of said solvent; and

replenishing said solvent in said separator vessels to maintain a sufficiently high concentration of solvent in contact with said gas stream in each separator vessel to enable essentially complete absorption of said toxic contaminants in said solvent.

4,690,699

APPARATUS FOR PRODUCING STERILE AIR

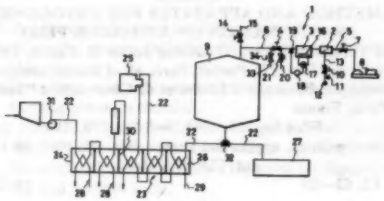
Ko Sugisawa, Nara; Kazuya Sekiguchi, Ikoma; Masao Taguchi, Osaka; Masayuki Nakatani, Higashiosaka, and Hitoshi Iwata, Tsuzuki, all of Japan, assignors to House Food Industrial Co., Ltd., Osaka, Japan

Filed Jun. 19, 1985, Ser. No. 746,393

Claims priority, application Japan, Jun. 27, 1984, 59-132200

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—267 **3 Claims**



1. An apparatus for producing sterile air, comprising:

a compressor;

an air supply pipe connecting a sterilizing filter for filtering microbes to said compressor and disposed downstream therefrom;

a connecting pipe connecting said sterilizing filter to an air heater disposed downstream from said sterilizing filter; a sterile air supply pipe connecting said air heater to a downstream aseptic tank, said sterile air supply pipe further having a shut-off valve;

and

an air or condensate discharging pipe having a discharge valve at least on the upstream side of said shut-off valve, said shutt-off valve being closed to discharge sterile air from said air heater through the discharge valve at an initial stage of the production of the sterile air.

4,690,700

BACKFLUSHED AIR FILTERS WITH QUICK OPENING MULTIPLE DISCHARGE VALVE

D. Franklin Howeth, 233 Chuck Wagon Trail, Fort Worth, Tex. 76108

Continuation-in-part of Ser. No. 549,963, Nov. 7, 1983, Pat. No. 4,544,389. This application Oct. 4, 1985, Ser. No. 784,872

Int. Cl.[4] B01D *46/04*

U.S. Cl. 55—302 **34 Claims**

1. A quick opening multiple jet discharge valve, which comprises:

a valve body including a main body having an inlet and a plurality of outlet nozzles arranged in a predetermined pattern so as to form overlapping jets of gas which expand to form a flow stream, each of said outlet nozzles having a valve seat interior of said valve body and an outlet exposed to ambient pressure exterior of said valve body, and a pilot pressure dome connected to said main body.

a valve member sealing positioned within said valve body between said pilot pressure dome and said outlet nozzle valve seats to divide said valve body into a primary chamber for receiving pressurized gas from said inlet and containing said outlet nozzle valve seats, and a pilot chamber, said valve member being movable between a closed position in engagement with said outlet nozzle valve seats and an open position;

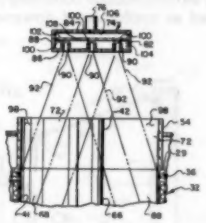
means for introducing pressurized gas into said pilot chamber to balance the pressure in said pilot chamber to equal the pressure in said primary chamber, thereby to urge said valve member into sealing engagement with said outlet nozzle valve seats to hold said valve member in said closed position.

and means for venting said pilot chamber to permit pressure in said primary chamber to move said valve member to said open position out of sealing engagement with said outlet nozzle valve seats, thereby to produce a quick exhaust of gas from said nozzles to produce a plurality of overlapping expanding jets of gas.

16. A porous media barrier type air filter unit, said filter unit including:

a housing forming a filter chamber including means for conducting dust laden air into said chamber;

a porous media barrier filter element in said filter chamber,



said filter element defining at least in part a clean air chamber for receiving air which has flowed through said filter element;

means for supporting said filter element in said filter chamber;

means forming a flow tube opening into said clean air chamber for conducting clean air from said clean air chamber and away from said filter element;

reverse flow air jet valve means disposed downstream of said filter element with respect to the direction of flow of clean air through said filter element, said valve means being in communication with a source of pressure air discharging in a predetermined pattern of multiple overlapping expanding frusto-conical jets forming a shaped jet of pressure air for contact with substantially the entire periphery of the walls of said flow tube, said valve means being arranged in such a way as to generate a jet having a cross sectional shape conforming to the cross sectional shape of said flow tube and for inducting a relatively large volume of substantially ambient pressure air into said flow tube in a direction opposite to the direction of flow of clean air out of said clean air chamber to backflush said filter element with a quantity of combined induced and jetted pressure air.

4,690,701

REUSABLE GREASE FILTER

Steven E. Hedrick, and Alan H. Gates, both of 771 S. Sherman, Denver, Colo. 80209

Filed Apr. 16, 1986, Ser. No. 852,559

Int. Cl.[4] B01D *45/16*

U.S. Cl. 55—436 **4 Claims**

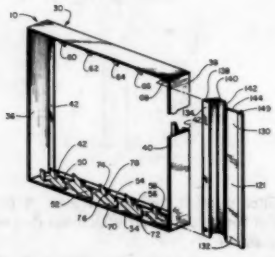
1. A reusable grease filter for installation in an exhaust system for restaurant cooking equipment and the like comprising:

frame means having a front portion, a back portion, a top portion, a bottom portion and lateral side portions adapted to be fixedly mounted in an exhaust system opening of similar shape to said frame means for supporting bracket means therein;

louver means positionable within said frame means having a plurality of discontinuous overlapping louver surfaces extending generally transversely of an exhaust system airflow direction and providing a plurality of tortuous air passages extending from a front portion of said louver means to a rear portion of said louver means, whereby passage of flame through said grease filter is substantially blocked by said transversely extending overlapping louver surface, and whereby grease and other airborne particles are removed from exhaust air passing through said tortuous passages through contact with said louver surfaces;

bracket means fixedly mounted on said frame means for stably holding said louver means in a predetermined position in said frame means and for enabling rapid removal and reinstallation of said louver means in said frame means for facilitating cleaning of said louver means;

wherein said louver means comprise a plurality of generally planar louver surfaces extending continuously from said top of said frame means to said bottom of said frame means and defining said tortuous air passages, whereby grease and other airborne liquids collecting on said louver means is provided an unobstructed downwardly directed flow



path by said planar surfaces to said bottom of said frame means, whereby said liquids are readily collectable in grease trough devices associated with said bottom of said frame means;

wherein said louver means comprises a plurality of individual louvers, each louver being integrally formed from a single metal plate and comprising a plurality of generally planar surfaces defining said planar louver surfaces and positioned in nonenclosing relationship with one another, whereby substantially all of said surfaces of a louver which is removed from said frame means are exposed, whereby said louvers are readily cleanable and reusable;

wherein said bracket means comprise a plurality of individual brackets mounted on said frame means top and bottom portions, said brackets each comprising an elongated inwardly projecting plate portion, said elongated plate portions of said brackets being arranged in parallel spaced apart relationship on said frame means, said brackets on said top portion of said frame means being positioned in mirror image relationship with said brackets on said bottom portion of said frame means;

wherein each said louvers comprises a plurality of vertically extending fold lines defining said plurality of planar surfaces, said louvers being relatively resiliently deflectable at said fold lines and having a shape adapted to fit in snug engagement between opposite portions of two laterally adjacent bracket plate portions whereby movement of said louver in a direction perpendicular to said bracket plate portions is restricted;

said louver means further comprising a hook shaped end portion adapted to receive a terminal end portion of said plate portion of an associated bracket therein for restricting the movement of said louver in a first direction generally parallel said bracket plate portion;

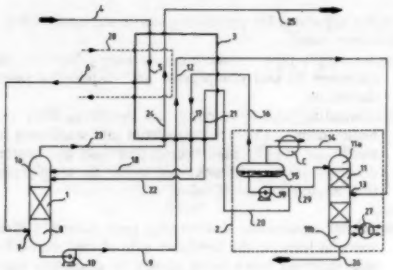
each said bracket comprising a nub surface protruding outwardly from said plate portion adapted to engage a terminal edge surface of an associated louver in snap-fit relationship, which edge surface is positioned at an end of said louver opposite said hook shaped end portion, for preventing movement of said louver in a second direction parallel to said bracket plate portion subsequent to snap-fit engagement of said louver with said nub surface.

4,690,702

METHOD AND APPARATUS FOR CRYOGENIC FRACTIONATION OF A GASEOUS FEED

Henri Paradowski, Cergy-Pontoise; Joëlle H. Castel, Le Pont Marly, and Hervé B. Parfait, Paris, all of France, assignors to Compagnie Francaise d'Etudes et de Construction "Technip" , Paris, France

Filed Sep. 25, 1985, Ser. No. 779,811
Claims priority, application France, Sep. 28, 1984, 84 14996
Int. Cl.[4] F23J *3/06*
U.S. Cl. 62—23 **16 Claims**



1. A method of cryogenic fractionation of a gaseous feed into a residual gas containing the most volatile compounds of the feed and into a liquid product containing the heaviest compounds of the feed, comprising the steps of:

injecting said feed in a partially condensed state into the bottom portion of a contact purifying-refrigerating column, which column produces in its head portion at least some of said residual gas, and in its bottom portion, a liquid;

withdrawing said liquid from said contact purifying-refrigerating column and injecting said liquid into a fractionating column to obtain in the bottom portion thereof a liquid product containing the heaviest compounds of the feed, and in the head portion thereof, a distillate;

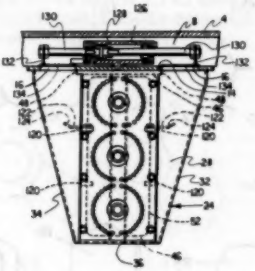
withdrawing said distillate from said fractionation column, and partially condensing and injecting said distillate as head supply into the said purifying-refrigerating column and recovering from the bottom of the fractionating column a liquid containing the heavy compounds contained in the vaporized fraction of a gaseous feed.

4,690,703

MOLD COOLING ARRANGEMENT FOR USE IN A GLASSWARE FORMING MACHINE

Constantine W. Kulig, Windsor, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Apr. 18, 1986, Ser. No. 853,538
Int. Cl.[4] C03B 9/38
U.S. Cl. 65—265 3 Claims



1. A glassware forming machine comprising

mold cavity means including bottom means and opposing side means,

said bottom and side means having vertically extending cooling passages therein,

air plenum means defined by one long end wall, an opposed short end wall, a pair of inwardly inclined side walls forming with said end walls a keystone configuration, and top and bottom walls,

means for mounting said mold cavity means on the top wall of said air plenum means with said cooling passages communicating with the interior of said plenum means and with said mold cavity means centered on a line bisecting said end walls,

horizontally spaced opening means in said long end wall,

second air plenum means communicating with said first air plenum means through said horizontally spaced opening means so that air under pressure can be fed from said second air plenum means into said first air plenum means towards said short end wall, said inclined side walls being located outwardly from said mold cavity means so that the air will be directed centrally inwardly towards said mold cavity means.

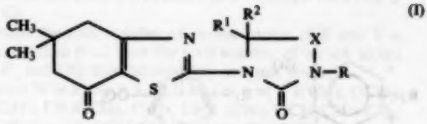
4,690,704

DERIVATIVES OF TETRAHYDROBENZOTHIAZOLE AND HERBICIDAL COMPOSITIONS CONTAINING THE SAME AS AN ACTIVE INGREDIENT

Katsumichi Aoki; Takafumi Shida; Hideo Arabori; Satoru Kumazawa; Susumu Shimizue; Takeo Watanave; Yohichi Kanda; Keigo Satake; Shiro Yamazaki; Hiroyasu Shinkawa, all of Iwaki, Japan, and Tsuneaki Chida, Greenbelt, Md., assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

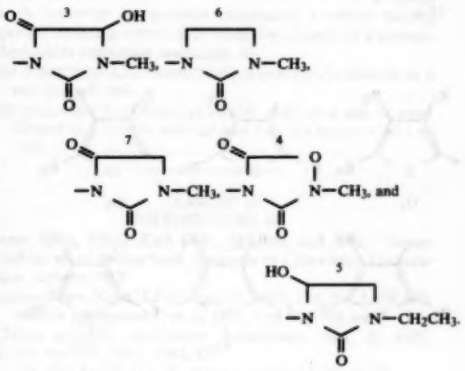
Continuation-in-part of Ser. No. 597,451, Apr. 6, 1984, Pat. No. 4,624,697. This application Jan. 17, 1986, Ser. No. 820,278
Claims priority, application Japan, Apr. 8, 1983, 58-61924
Int. Cl.[4] C07D 417/04; A01N 47/38
U.S. Cl. 71—90 2 Claims

1. A derivative of tetrahydrobenzothiazole represented by the formula (I):



(I)

wherein R represents a methyl group or ethyl group; R^1 represents a hydrogen atom, a hydroxyl group, methoxy group or =O together with R^2; R^2 represents a hydrogen atom or =O together with R^1 and X represents a methylene group, hydroxymethylene group, carbonyl group —O—, with the proviso that (1) X is not a methylene group when R^1 represents a methoxy group, (2) X is not a carbonyl group when R^1 represents =O together with R^2, (3) R is not an ethyl group when R^1 represents =O together with R^2 and X represents a hydroxymethylene group and (4) R is not a methyl group when R^1 represents a hydroxyl group and X represents a methylene group or a hydroxymethylene group, when R^1 represents a methoxy group and X represents a hydroxymethylene group, or when R^1 represents a hydrogen atom and X represents a carbonyl group; wherein the imidazolidinone moiety of said derivative is one selected from the group consisting of



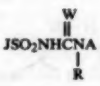
4,690,705

HERBICIDAL SULFONAMIDES

Joel R. Christensen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 676,891, Nov. 30, 1984, abandoned. This application Oct. 23, 1985, Ser. No. 788,711
Int. Cl.[4] C07D 403/14, 417/14; A01N 47/36
U.S. Cl. 71—90 30 Claims

1. A compound of the formula

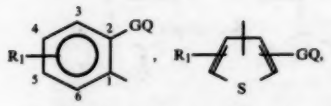


I

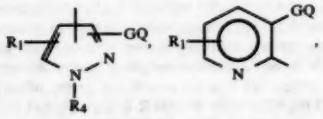
wherein

W is O or S;

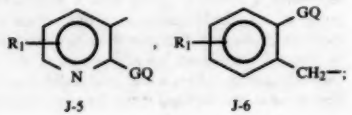
J is



J-1 J-2

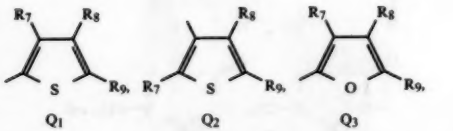


J-3 J-4

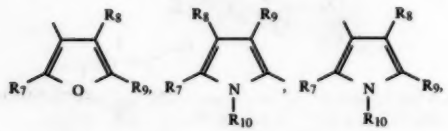


J-5 J-6

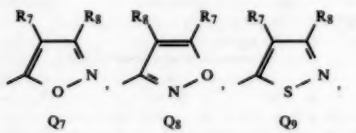
Q is



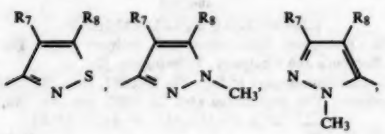
Q1 Q2 Q3



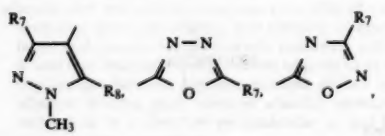
Q4 Q5 Q6



Q7 Q8 Q9

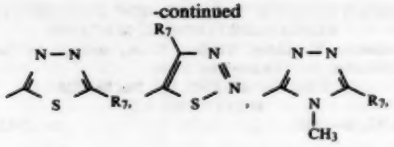


Q10 Q11 Q12

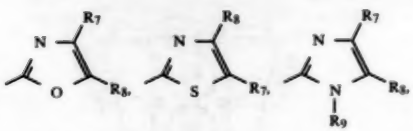


Q13 Q14 Q15

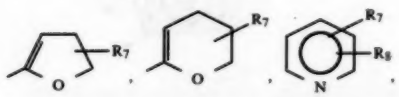
-continued



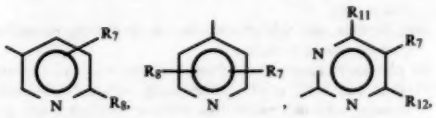
Q16 Q17 Q18



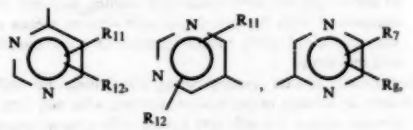
Q19 Q20 Q21



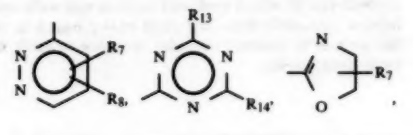
Q22 Q23 Q24



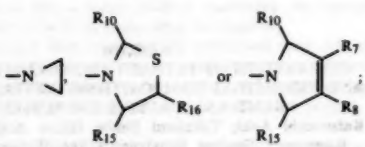
Q25 Q26 Q27



Q28 Q29 Q30



Q31 Q32 Q33



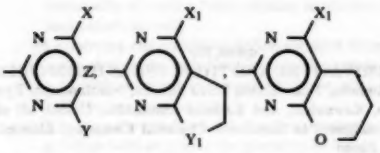
Q34 Q37 Q38

G is a C_1–C_3 alkyl radical in which one of the carbons must be substituted with R_2 and/or R_3, and the remaining carbon atoms may optionally be substituted with 1 or 2 substituents selected from CH_3, F and Cl;

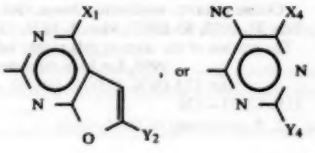
R is H or CH_3;

R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, nitro C_1–C_3 alkoxy, $SO_2NR^IR^{II}$, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CO_2R^{III}, CH_2OCH_3, CH_2SCH_3, CH_2CN, NH_2, $NHCH_3$ or $N(CH_3)_2$;

R_2 is OH, OCH_3 or OC_2H_5;
R_3 is OCH_3 or OC_2H_5; or
R_2 and R_3 can be taken together to form a carbonyl group, or the 5- or 6-membered ring ketal or thioketal thereof;
R^I is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;
R^{II} is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or
R^I and R^{II} may be taken together as $-(CH_2)_3-$, $-(CH_2)_4-$, $-(CH_2)_5-$ or $-CH_2CH_2OCH_2CH_2-$;
R^{III} is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_2–C_3 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;
A is

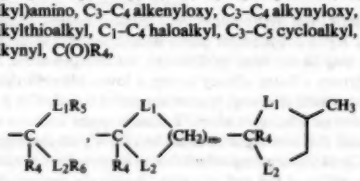


A-1 A-2 A-3



A-4 A-7

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;
Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_1–C_4 haloalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl, C(O)R_4,



or $N(OCH_3)CH_3$;
m is 2 or 3;
L_1 and L_2 are independently O or S;
R_5 and R_6 are independently C_1–C_2 alkyl;
R_4 is H or CH_3;
Z is CH;
Y_1 is O or CH_2;
X_1 is CH_3, OCH_3, OC_2H_5 or OCF_2H;
Y_2 is H or CH_3;
X_4 is CH_3, OCH_3, OC_2H_5, CH_2OCH_3 or Cl; and
Y_4 is CH_3, OCH_3 or OC_2H_5;
R_7, R_8 and R_9 are independently H, CH_3, Cl or Br;
R_{10}, R_{15} and R_{16} are independently H or CH_3;
R_{11} and R_{12} are independently H, CH_3 or OCH_3; and
R_{13} and R_{14} are independently CH_3 or OCH_3;
and their agriculturally suitable salts; provided that
(a) when X is Cl, F, Br or I, then Y is OCH_3, OCH_2CH_3, $N(OCH_3)CH_3$, $NHCH_3$, $N(CH_3)_2$ or OCF_2H;
(b) when J is J-2 or J-3, then GQ and the sulfonylurea bridge must be on adjacent carbon atoms;
(c) when Q is bonded to G through nitrogen, then the adjacent carbon atom of G cannot be substituted with OH, F or Cl;
(d) when the total number of carbon atoms of X and Y is greater than four, then the total number of carbon atoms of R_1 and GQ must be less than or equal to ten;
(e) when W is S, the A is A-1, R is H, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$ or $CH(OCH_3)_2$; and
(f) when R_3 is OCH_3 or OC_2H_5, then R_2 is other than OH.

4,690,706

HERBICIDE

Adolf Fischer, deceased, late of Mutterstadt, Fed. Rep. of Germany (by Caecilia Emma Fischer, legal representative), assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 257,867, Apr. 27, 1981, abandoned, which is a continuation of Ser. No. 98,860, Nov. 30, 1979, abandoned, which is a continuation of Ser. No. 732,899, Oct. 15, 1976, abandoned, which is a continuation of Ser. No. 453,305, Mar. 21, 1974, abandoned. This application Nov. 16, 1981, Ser. No. 321,727

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1973, 2319364

Int. Cl.[4] A01N *43/88*

U.S. Cl. 71—91 **6 Claims**

1. A herbicide composition comprising a carrier having dispersed therein a herbicidally effective amount of a mixture of herbicides consisting essentially of
(a) 3-isopropyl-2,1,3-benzothiadiazinone-(4)-2,2-dioxide or a salt thereof, and
(b) γ-(2,4-dichlorophenoxy)-butyric acid or a salt or ester thereof in a weight ratio of a to b in the range of 10:1 to 1:10.

4,690,707

SULFONYLUREAS

Werner Föry, Basel; Karl Gass, Magden, and Willy Meyer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

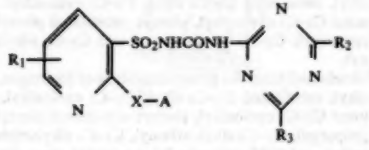
Division of Ser. No. 527,599, Aug. 29, 1983, Pat. No. 4,579,583. This application Oct. 4, 1985, Ser. No. 784,446

Claims priority, application Switzerland, Sep. 8, 1982, 5337/82; Apr. 28, 1983, 2283/83

Int. Cl.[4] C07D *251/18, 401/12;* **A01N** *43/66, 43/70*

U.S. Cl. 71—93 **21 Claims**

1. An N-pyridylsulfonyl-N'-triazinylurea of the formula



wherein
A is C_3–C_6alkynyl, C_1–C_6alkyl which is substituted by halogen or C_1–C_4alkoxy, C_2–C_4alkenyl which is unsubstituted or substituted by halogen or C_1–C_4alkoxy, or phenyl which is unsubstituted or substituted by halogen, cyano, nitro, C_1–C_4alkyl, C_1–C_4haloalkyl or —X—C_1–C_4alkyl,
R_1 is hydrogen, halogen or C_1–C_4alkyl,
R_2 is C_1–C_3alkyl which is unsubstituted or substituted by 1 to 3 halogen atoms, or is C_1–C_3alkoxy,
R_3 is hydrogen, halogen, an amino group —NR_4R_5, or C_1–C_3 alkyl which is unsubstituted or substituted by 1 to 3 halogen atoms, or is C_1–C_4alkoxy which is unsubstituted or substituted by methoxy, ethoxy or 1 to 3 halogen atoms,
R_4 is hydrogen or methyl,
R_5 is hydrogen, C_1–C_2alkyl or methoxy,

R_6 and R_7 are each independently hydrogen or C_3–C_6alkenyl, and

X is oxygen,

or a salt of such a compound.

15. A herbicidal and plant growth regulating composition which contains an effective amount of an N-pyridylsulfonyl-N'-triazinylurea according to claim **1**, together with an inert carrier and/or other inert adjuvants.

4,690,708

HERBICIDES DERIVED FROM ARYLOXYBENZENECARBOXYLIC ACID IMIDES

Alain Chene, and Guy Borrod, both of Lyons, France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

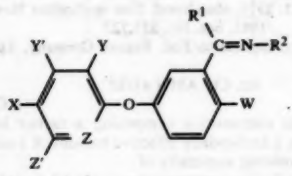
Filed Jul. 11, 1984, Ser. No. 629,895

Claims priority, application France, Jul. 12, 1983, 83 11858

Int. Cl.[4] A01N *43/40*

U.S. Cl. 71—94 **38 Claims**

1. A compound of the formula:



wherein:

Z is selected from the group consisting of nitrogen and —C(X')=;

W, Y, Y', X, Z' and X' are each independently selected from the group consisting of hydrogen, halogen, NO_2, CN, C_1–C_4 polyhalogenoalkyl, C_1–C_4 alkyl and C_1–C_4 alkoxy;

R^1 is selected from the group consisting of halogen, X^2R^3 and NR^4R^5;

R^2 is selected from the group consisting of hydrogen, halogen, allyl, propargyl, CN, NR^4R^5, $C(X^2)R^7$, $C(X^2)X^3R^8$, $C(X^2)NR^4R^5$, SO_2F, SO_2OR^8, $SO_2NR^4R^5$, $P(X^2)R^9R^{10}$ and C_1–C_4 alkyl substituted by one or more of each of halogen, C_1–C_4 alkoxy, C_1–C_4 alkylthio, NO_2, CN, phenyl, phenyl substituted by one or more halogen atoms, and a carboxyl group or one of its derivatives of the salt, ester or amide type;

R^3 is selected from the group consisting of C_1–C_4 alkyl, substituted C_1–C_4 alkyl, allyl and propargyl;

R^4 is selected from the group consisting of hydrogen, C_1–C_4 alkyl, substituted C_1–C_4 alkyl, C_3–C_7 cycloalkyl, substituted C_3–C_7 cycloalkyl, phenyl, substituted phenyl, allyl, propargyl, C_1–C_4 alkylcarbonyl and C_1–C_4 alkylsulphonyl;

R^5 is selected from the group consisting of hydrogen, C_1–C_4 alkyl, substituted C_1–C_4 alkyl, C_3–C_7 cycloalkyl, substituted C_3–C_7 cycloalkyl, phenyl, substituted phenyl, allyl, propargyl, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylsulphonyl, a cation and OR^6, wherein R^6 is selected from the group consisting of hydrogen, a cation, C_1–C_4 alkyl and substituted C_1–C_4 alkyl;

X^2 and X^3 are each independently selected from the group consisting of oxygen and sulphur;

R^7 is selected from the group consisting of hydrogen, C_1–C_{12} alkyl, substituted C_1–C_{12} alkyl, C_3–C_7 cycloalkyl, substituted C_3–C_7 cycloalkyl, phenyl, substituted phenyl, C_2–C_4 alkenyl and C_2–C_4 alkynyl;

R^8 is selected from the group consisting of hydrogen, C_1–C_4 alkyl, substituted C_1–C_4 alkyl, C_3–C_7 cycloalkyl, substituted C_3–C_7 cycloalkyl, phenyl, substituted phenyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl and a cation;

R^9 and R^{10} are each independently selected from the group consisting of hydrogen, C_1–C_4 alkyl, substituted C_1–C_4 alkyl, hydroxyl, OM, wherein M is a cation, halogen, X^2R^3 and NR^4R^5, wherein R^3, R^4, R^5 and X^2 are as previously defined above, provided that

(a) R^2 is not $COOCH_3$ when R^1 is OCH_3, W is NO_2, Y' and Z' are H, X is CF_3, Y is Cl and Z is —CH=, and provided futher that

(b) R^2 is not H when X is NO_2.

4,690,709

UREA DERIVATIVES, AND THEIR USE AS HERBICIDES

Ichiki Takemoto, Takarazuka; Seizo Sumida, Nishinomiya; Ryo Yoshida, Kawanishi, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 952,775, Oct. 19, 1978, Pat. No. 4,309,212. This application Nov. 3, 1980, Ser. No. 203,485

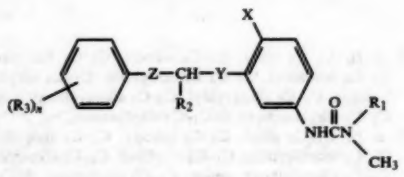
Claims priority, application Japan, Oct. 26, 1977, 52-129089; Feb. 28, 1978, 53-23027; Mar. 1, 1978, 53-23891

The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.

Int. Cl.[4] C07C *127/19, 119/00*; A01N *47/30*

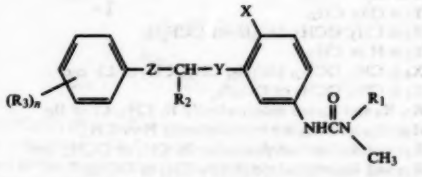
U.S. Cl. 71—120 **17 Claims**

1. A compound of the formula:



wherein R_1 is a hydrogen atom, a methyl group or a methoxy group, R_2 is a hydrogen atom or a lower alkyl group, R_3, which may be the same or different, is a halogen atom, a lower alkyl group, a lower alkoxy group, a lower alkylthio group or a trifluoromethyl group, n is an integer of 0 to 5, X is a hydrogen atom or a halogen atom, Y is an oxygen atom or a sulfur atom and Z is a straight or branched C_1–C_8 alkylene group or a C_1–C_8 alkylene group which has at least one atom of oxygen and/or sulfur at the end of and/or inside the carbon chain.

17. A method for the selective control of broadleaf weeds in the presence of crops, said method comprising: applying, as an active ingredient, to said weeds or to soil containing seeds of said weeds a herbicidally effective amount of a compound of the formula:



(I)

wherein Y is oxygen; R_3, which may be the same or different, is a halogen atom, a C_1–C_3 alkyl group, a C_1–C_4 alkoxy group, a methylthio group or a trifluoromethyl group; n is an integer of 0 to 3; Z is a C_1–C_4 alkylene group; R_1 is a methoxy group; R_2 is hydrogen and X is hydrogen.

4,690,710

PROCESS FOR PRODUCING COBALT METAL POWDER

Richard A. Scheithauer; Clarence D. Vanderpool; Michael J. Miller, and Richard G. W. Gingerich, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 31, 1985, Ser. No. 793,079
Int. Cl.[4] C22C *1/04*
U.S. Cl. 75—0.5 AA 7 Claims

1. A process for producing pure cobalt metal powder, said process comprising:

(a) contacting a cobaltous salt with a sufficient amount of an alkaline earth halide in an aqueous solution at a sufficient temperature for a sufficient time to form a solution which is essentially cobaltous halide and a solid which consists essentially of a salt of said alkaline earth and the anion of said cobaltous salt;

(b) removing the cobaltous halide solution from the solid;

(c) complexing the cobaltous ions in the cobalt halide solution with ammonia in the presence of a catalyst to form a cobaltic hexammine ion;

(d) treating the resulting cobaltic hexammine ion containing solution with an acid in the presence of halide ions to form a cobaltic hexammine halide precipitate;

(e) removing said precipitate from the resulting mother liquor and impurities;

(f) dissolving said precipitate in an aqueous solution to form a relatively pure solution thereof;

(g) treating said relatively pure solution with a sufficient amount of a metallic hydroxide to form a cobalt containing precipitate; and

(h) reducing said cobalt containing precipitate to form cobalt metal.

4,690,711

SINTERED COMPACT AND PROCESS FOR PRODUCING SAME

Brian C. Coad, San Francisco, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 680,105, Dec. 10, 1984, abandoned. This application May 21, 1986, Ser. No. 865,303
Int. Cl.[4] C22C *19/05, 38/18, 38/32, 38/54*
U.S. Cl. 75—244 3 Claims

1. A compact having an iron group alloy additive selected from a nickel boron-silicon alloy having nickel as the major element and an iron-silicon-chromium-nickel alloy having iron as the major element as a continuous phase and iron as a discontinuous phase wherein said additive has a melting point of at least about 50° C. lower than that of the discontinuous phase.

4,690,712

POLYAMIDE-MODIFIED METAL RESINATES AND THEIR USE IN PUBLICATION GRAVURE PRINTING INKS

Edward G. Janusz, Wallington, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,530
Int. Cl.[4] C09D *11/08*
U.S. Cl. 106—30 6 Claims

1. A printing ink comprising a polyamide-modified metal resinate, a pigment, and a solvent.

3. A process for the preparation of a polyamide-modified metal resinate which comprises reacting a metal resinate in solution with a polyamide in solution at a temperature within the range of about 25° to 100° C.

4,690,713

ANTIFOAM COMPOSITION

Nobuyuki Terse; Masaaki Yamaya, and Fumio Okada, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1985, Ser. No. 694,218
Claims priority, application Japan, Jan. 27, 1984, 59-13178
Int. Cl.[4] C09K *3/00*; B01D *17/00*
U.S. Cl. 106—287.16 6 Claims

1. An antifoam composition which comprises:

(a) 100 parts by weight of a hydrophobic base fluid selected from the class consisting of hydrocarbon oils and organopolysiloxane fluid having a viscosity in the range from 20 to 1,000,000 centistokes at 25° C.;

(b) from 0.1 to 40 parts by weight of an organosilicon compound represented by the general formula $R^1_aY_bSi$, in which R^1 is a substituted or unsubstituted monovalent hydrocarbon group having 1 to 20 carbon atoms, Y is a monovalent group selected from the class consisting of alkoxy groups, acyloxy groups and alkenyloxy groups having 1 to 6 carbon atoms and a hydroxy group and the suffixes a and b are each a positive integer of 1, 2 or 3 with the proviso that a+b=4;

(c) from 1 to 40 parts by weight of a finely divided silica powder; and

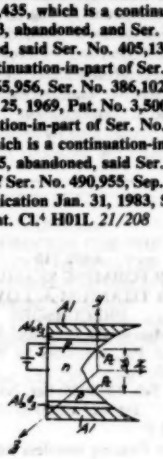
(d) up to 5 parts by weight of a catalyst.

4,690,714

METHOD OF MAKING ACTIVE SOLID STATE DEVICES

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Continuation-in-part of Ser. No. 7,584, Jan. 29, 1979, Pat. No. 4,371,406, which is a continuation of Ser. No. 764,433, Jan. 31, 1977, Pat. No. 4,136,435, which is a continuation of Ser. No. 405,138, Oct. 10, 1973, abandoned, and Ser. No. 580,414, May 23, 1975, abandoned, said Ser. No. 405,138, and Ser. No. 580,414, each is a continuation-in-part of Ser. No. 190,483, Oct. 19, 1971, Pat. No. 3,765,956, Ser. No. 386,102, Aug. 6, 1973, and Ser. No. 802,018, Feb. 25, 1969, Pat. No. 3,500,135, said Ser. No. 190,483, is a continuation-in-part of Ser. No. 868,129, Oct. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 491,718, Sep. 30, 1965, abandoned, said Ser. No. 802,018, is a continuation-in-part of Ser. No. 490,955, Sep. 28, 1965, Pat. No. 3,430,109. This application Jan. 31, 1983, Ser. No. 462,374
Int. Cl.[4] H01L *21/208*
U.S. Cl. 437—208 25 Claims



1. A method of making an integral, polycrystalline, active, solid-state device comprising the steps of:

non-eutectically forming a structure comprising a multiplicity of semiconductor material bodies separated from each

other by other material, wherein each body comprises substantially single crystal material and there is physical, but not crystallographic, continuity between the single crystal bodies and the other material, said forming step further comprising forming electronic rectifying barriers within a fraction of a micron from a specified location at or adjacent at least a portion of the interface between each single crystal body and the adjacent other material, including selecting the characteristics of the semiconductor material and the other material to produce preselected electrical characteristics of said electronic rectifying barriers; and

providing electrical contacts to said structure for operation thereof as an active device.

4,690,715

MODIFICATION OF THE PROPERTIES OF METALS

David L. Allara, Florham Park, and Ralph G. Nuzzo, Summit, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 18, 1982, Ser. No. 389,775

Int. Cl.[4] C23C *22/08*; B03D *3/10*

U.S. Cl. 148—6.15 R **22 Claims**

1. A process for fabricating a metal layer on a substrate comprising the steps of

(1) treating said substrate with a modifier, said modifier comprising a compound having (a) an organic functional group which interacts with the surface of said substrate to form a chemical bond and (b) a reactive moiety, and

(2) forming a layer of said metal on said treated substrate wherein said reactive moiety reacts with the species of said metal used in said formation.

4,690,716

PROCESS FOR FORMING SEAMLESS TUBING OF ZIRCONIUM OR TITANIUM ALLOYS FROM WELDED PRECURSORS

George P. Sabol, Murrysville Boro, and Robert F. Barry, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 13, 1985, Ser. No. 701,326

Int. Cl.[4] C21D *8/10*

U.S. Cl. 148—11.5 F **15 Claims**

1. A process for forming seamless tubing of a material selected from zirconium, zirconium alloys, titanium, and titanium alloys, from welded precursor tubing of said material, having a heterogeneous structure resulting from the welding thereof, comprising:

heating succesive axial segments of the welded tubing, completely through the wall thereof, including the weld, to uniformly transform the heterogeneous, as welded, material into the beta phase;

quenching said beta phase tubing segments, said heating and quenching effected sufficiently rapid enough to produce a fine sized beta grain structure completely throughout the precursor tubing, including the weld, and to prevent growth of beta grains within the material larger than 200 micrometers in diameter; and

subsequently substantially uniformly deforming said quenched precursor tubing by cold reduction steps to produce a seamless tubing of final size and shape.

4,690,717

METHOD OF MAKING SEMICONDUCTOR DEVICE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Division of Ser. No. 525,459, Aug. 22, 1983, Pat. No. 4,591,892. This application Nov. 22, 1985, Ser. No. 800,694

Claims priority, application Japan, Aug. 24, 1982, 57-146561; Oct. 18, 1982, 57-182546

Int. Cl.[4] H01L *21/205*

U.S. Cl. 437—2 **6 Claims**

1. A method of making a semiconductor device, said method comprising:

forming a non-single-crystal semiconductor laminate member on a substrate or a conductive layer, said laminate member including at least one I-type non-single-crystal semiconductor layer and having formed therein at least one PI, NI, PIN, or NIP junction, said I-type layer being formed using a silane gas obtained by passing a raw silane gas of high purity through a passage containing a molecular sieve having a mesh diameter of 2.7 to 4.65 A or zeolite having a pore diameter of the same size;

wherein the I-type non-single-crystal semiconductor layer of the non-single-crystal semiconductor laminate member contains oxygen only in such a low concentration as 5×10^{18} atoms/cm^3 or less.

4,690,718

APPARATUS FOR AND METHOD OF MAKING THE CABLE CORE OF A TELECOMMUNICATION CABLE WATER-TIGHT IN THE LONGITUDINAL DIRECTION

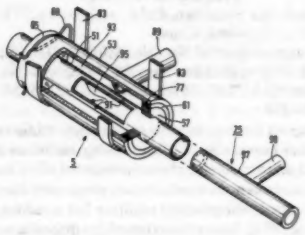
Johannis A. B. Laugs, Gouda; Gerrit Van Den Berg, Vlaardingen; Peter A. Van Daalen, Bleiswijk, and Edward D. Reinders, Boskoop, all of Netherlands, assignors to N.K.F. Groep B.V., Rijswijk, Netherlands

Filed Nov. 18, 1985, Ser. No. 799,212

Claims priority, application Netherlands, Nov. 19, 1984, 8403514

Int. Cl.[4] H01B *13/14*

U.S. Cl. 156—48 **10 Claims**



1. A method of making the cable core of a telecommunication cable water-tight in the longitudinal direction, in which the cable core consisting of stranded single wires is passed through a filling head, a filling material mainly consisting of hydrocarbons is supplied under pressure and in an excess quantity to the filling head at a temperature above the pour point of the material, is spread over the circumference of the cable core and is introduced into the cable core and the excess filling material not absorbed by the cable core is drained away, characterized in that the filling material is divided into a number of separate jets distributed over the circumference of the cable core so that a substantially complete conversion of the static pressure into dynamic pressure is obtained and the filling material is injected at a high speed, solely in purely radial directions and without generation of an axial speed component, through the outer layer of the cable core at least into the heart of the cable core in a manner such that a reconversion of the dynamic pressure into static pressure is effected in the cable core.

6. An apparatus for carrying out the method claimed in claim 1, comprising a container for filling material, a filling

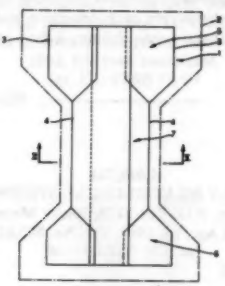
head, a pump for the supply of filling material from said container to the filling head and heating means for heating the filling material, the filling head comprising an annular pressure chamber and a central passage coaxial with said pressure chamber through which said cable core is transported, the pressure chamber being connected to the pump and being in communication with the passage chamber through a series of orifices in a separation wall, characterized in that the passage chamber extends without any restriction from one end to the other end of the filling head, is provided with two ends both of which are open and is in free communication with the immediate surroundings.

4,690,719

EGG TIMER-SHAPED ABSORBENT PAD FOR A PAIR OF NAPPY-PANTS, AND PROCESS FOR THE CONTINUOUS MANUFACTURE OF SUCH PADS

Gérard Lucas, Bousbecque; Jacques Dussaud, La Madeleine, and André Leroy, Bousbecque, all of France, assignors to Boussac Saint Freres B. S. F., Lille, France

Filed Aug. 26, 1986, Ser. No. 900,642
Claims priority, application France, Aug. 27, 1985, 85 12808
Int. Cl.[4] B32B *1/00*
U.S. Cl. 156—201 **8 Claims**



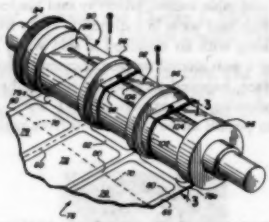
1. Process for the continuous manufacture of egg timer-shaped absorbent pads, having a rectangular general shape with two opposite lateral indentations, for a pair of nappy-pants, comprising, in the direction of its length, two end zones and a between-the-legs intermediate zone of width smaller than and thickness greater than those of the end zones, characterized in that in a strip of absorbent material (**10**) of width greater than the maximum width of the pads to be manufactured, at intervals corresponding to the length of the pads to be manufactured, two opposite incisions (**11**) symmetrical in relation to the longitudinal median line (**12**) of the strip and comprising, in the direction of the length of the strip, two diverging parts (**13**), followed by two converging parts (**15**) are successively made, in that the two lateral parts (**17**) of the strip (**10**), included between each incision (**11**) and the longitudinal lines (**16**) connecting between them the successive incisions on the one hand, and the corresponding longitudinal edge (**19**) of the strip (**10**) on the other, are folded over each other around the said longitudinal lines and over the median part (**18**) of the strip situated between the said lines (**16**), and in that the strip thus folded is cut in the transverse direction at intervals corresponding to the length of the absorbent pads to be manufactured, at the place where the distance separating the opposite incisions (**11**) is maximal.

4,690,720

METHOD OF MANUFACTURING MULTILAYER LABELS AND APPARATUS THEREFOR

Jory B. Mack, Chicago, Ill., assignor to Pamco Label Co., Rosemont, Ill.

Filed Jan. 16, 1986, Ser. No. 819,516
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—248 **31 Claims**



1. A method of manufacturing multilayer labels, which comprises:

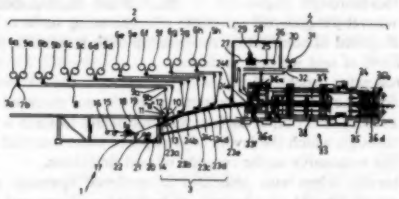
providing first and second continuous webs, said first web having an adhesive surface; adhering leaflet members by automated means to said adhesive surface of the first web to place a plurality of said leaflet members on said first web in spaced relation to each other; bringing the adhesive surface of said first web into adhering contact with a face of said second web, with the leaflet members positioned between said adhering webs; forming a line of tearing weakness in said first web adjacent each leaflet member to permit opening of said first web for access for the leaflet member, said second web having an adhesive surface covered with a removable backing web facing away from said first web; and die cutting said first and second webs to provide a plurality of separate, leaflet-carrying, multilayer labels without cutting said backing web, whereby the labels produced are removably carried on said backing web.

4,690,721

APPARATUS AND PROCESS FOR THE PRODUCTION OF MULTILAYER LAMINATED PLATES

Konrad Schermutzki, Remseck, Fed. Rep. of Germany, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Jun. 25, 1984, Ser. No. 624,925
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324302
Int. Cl.[4] C09J *5/02*
U.S. Cl. 156—307.5 **20 Claims**



13. A process for producing multi-level laminated plates, such as electronic circuit boards, from webs of pregnable fibrous material, said process comprising the steps of:

providing a plurality of webs of pregnable fibrous material, advancing said webs,

applying a binder substance to a web first surface as said webs are being advanced,

stacking said webs one upon the other,

conducting said webs in the stacked condition through a temperature control zone in which said web travel along a table means and in which the temperature of said binder substance in controlled,

reversing the direction of web travel in advance of said table means and following the application of said binder substance so that said web first surface is oriented in facing relationship to said table means as said web first surface reaches said table means, whereby said binder substance is pressed into said webs in a direction away from said table means along with air disposed in said webs, and

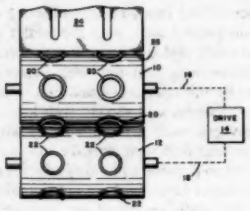
maintaining a web second surface, located opposite said web first surface, exposed to ambient surroundings for a distance following the arrival of said webs at said table means, to permit air to be expelled from said webs.

4,690,722

ULTRASONIC APPARATUS FOR JOINING AND SEVERING SHEET MATERIAL

Gary N. Flood, Washington Depot, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Oct. 24, 1986, Ser. No. 923,030
Int. Cl.[4] B29C *65/08;* **B32B** *31/18*
U.S. Cl. 156—510 **6 Claims**



1. An apparatus for joining two or more juxtaposed layers of sheet material, at least one of said layers containing thermoplastic material, in accordance with a desired pattern, comprising:

a first rotatably mounted drum having a pattern of raised welding surfaces along its surface, said pattern corresponding to the desired pattern;

a second rotatably mounted drum having along its surface a pattern of raised cutting surfaces corresponding at least in part to said pattern of welding surfaces, said second drum mounted in facing relationship with said first drum for providing therebetween a nip for feeding sheet material therethrough responsive to the rotation of said drums whereby sequentially portions of said cutting surfaces are disposed in confronting relationship with respective portions of said welding surfaces;

a resonator capable of providing vibrations in the ultrasonic frequency range at an output surface thereof mounted for causing said output surface and first drum to form a nip through which the layers of juxtaposed sheet material are fed responsive to the rotation of said first drum,

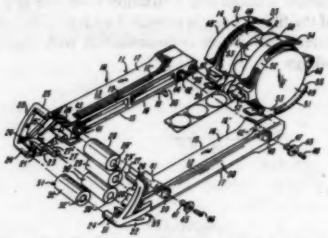
whereby when said resonator is rendered resonant and urged toward said pattern of welding surfaces and the sheet material is fed through the nip between said output surface and said first drum the juxtaposed layers are welded to one another in accordance with the pattern of welding surfaces and when the material is fed through the nip between said first drum and second drum the welded layers are severed in accordance with the pattern of cutting surfaces of said second drum.

4,690,723

HAND-HELD LABELER

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 408,310, Aug. 16, 1982, Pat. No. 4,619,727.
This application Jun. 6, 1986, Ser. No. 871,659
Int. Cl.[4] B44B *5/00;* **B32B** *31/00*
U.S. Cl. 156—541 **23 Claims**



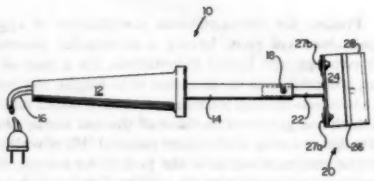
1. A hand-held labeler for applying labels releasably adhered to a carrier web, comprising: a labeler body, means for successively delaminating labels from a carrier web, means adjacent the delaminating means for applying labels, means including a feed roll adapted to contact a surface to be labeled for advancing the carrier web, means defining a feed path for the carrier web to the delaminating means and from the delaminating means to the carrier web advancing means, the labeler body having a pair of adjacent identical one-piece molded plastics body sections, and wherein each one-piece body portion includes a portion of the means defining a feed path.

4,690,724

ELECTRICALLY HEATED DECAL STRIPPING TOOL

William F. Outlaw, P.O. Box 1255, Rocky Mount, N.C. 27801

Filed Apr. 24, 1986, Ser. No. 855,811
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—584 **1 Claim**



1. A heat conductive decal stripper attachment for a portable soldering iron of the type having a handle and a barrel and comprising:

an elongate base adapted to be removably secured to said barrel so that the longitudinal axis thereof will be substantially coaxial with that of said barrel; and

an elongate head portion affixed thereto so that the longitudinal axis of said head portion is substantially perpendicular to that of said base, said head portion comprising biased clamping means for replaceably engaging and supporting a single edge razor blade with the blade thereof positioned at the outermost operative end of said soldering iron.

4,690,725

PURIFICATION OF CD AND TE BY ZONE REFINING

Roelof P. Bult, Fruitvale; Alan B. I. Bollong, Trail, and Robert F. Redden, Fruitvale, all of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Nov. 22, 1985, Ser. No. 800,932
Int. Cl.[4] C01B *19/02*; C30B *13/02, 13/08*
U.S. Cl. 156—617 R 5 Claims

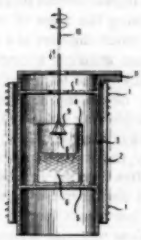
1. A method for the purification of a metal chosen from the group consisting of cadmium and tellurium which comprises adding to an ingot of the metal an amount of a gettering substance chosen from the group consisting of tellurium, cadmium and cadmium telluride, subjecting the metal with added gettering substance to multiple-pass zone refining, said amount of tellurium or the amount of tellurium in cadmium telluride added in the zone refining of cadmium being less than the amount of tellurium in the cadmium rich eutectic composition between cadmium and tellurium, and said amount of cadmium or the amount of cadmium in cadmium-telluride added in the zone refining of tellurium being less than the amount of cadmium in the tellurium-rich eutectic composition between cadmium and tellurium, and cropping said ingot after multiple zone refining to recover a product of reduced impurity content.

4,690,726

LIQUID PHASE EPITAXIAL GROWTH OF BISMUTH-CONTAINING GARNET FILMS

Lars C. Luther, Basking Ridge, N.J., and Virendra V. Singh Rana, Allentown, Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 615,836, May 31, 1984, Pat. No. 4,544,438. This application Sep. 11, 1985, Ser. No. 774,665
The portion of the term of this patent subsequent to Sep. 30, 2002, has been disclaimed.
Int. Cl.[4] C30B *19/04*
U.S. Cl. 156—624 2 Claims



1. Method for making a magnetic device comprising a layer of garnet material which contains bismuth and which is epitaxially deposited on a surface of a supporting substrate, said method comprising

heating a preferred melt consisting essentially of a garnet material which contains bismuth and a flux material at a temperature corresponding to supercooling of said garnet material, said flux material comprising lead oxide and bismuth oxide and chromium trioxide, the lead oxide being comprised in said flux material in an amount corresponding to an amount of PbO in the range of from 50 to 98 molecular percent, the bismuth oxide being comprised in said flux material in an amount corresponding to an amount of Bi_2O_3 in the range of from 1 to 30 molecular percent, said chromium trioxide being comprised in said flux material in an amount corresponding to CrO_3 in the range of 1 to 20 molecular percent,

bringing at least a surface of a substrate in contact with said melt, and

removing said substrate from contact with said melt upon deposition of a layer of said garnet material on said surface,

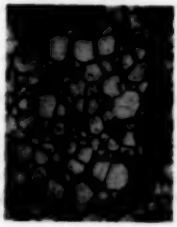
the degree of supercooling being chosen in combination with amount of said chromium trioxide so as to substantially achieve a desired level of magnetic anisotropy in said layer.

4,690,727

GLAZE POLISHING POLYCRYSTALLINE ALUMINA MATERIAL

Curtis E. Scott, Eastlake, and Charles I. McVey, Twinsburg, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 666,858, Oct. 31, 1984, Pat. No. 4,633,137.
This application Aug. 12, 1986, Ser. No. 895,965
Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—635 7 Claims



1. A method of increasing the optical transmission of an optically transparent body of sintered polycrystalline alumina which comprises:

(a) depositing a solid glaze coating on at least one major surface of said alumina body which dissolves the surface alumina in physical contact therewith when subsequently melted at elevated temperatures, said solid glaze coating comprising an alkali metal borate other than lithium borate having an alkali metal oxide to boron oxide weight ratio in the range from about 1:2 up to about 1:4,

(b) heating said coated alumina body to elevated temperatures of at least about 800° C. for a sufficient time period to liquify the glaze coating and dissolve the surface alumina grains, and

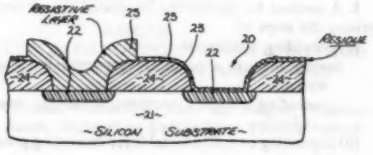
(c) removing the coating residue from the surface of said alumina body.

4,690,728

PATTERN DELINEATION OF VERTICAL LOAD RESISTOR

Chi-Hwa Tsang; Galen Kawamoto, both of Beaverton, and Leopoldo D. Yau, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 23, 1986, Ser. No. 922,289
Int. Cl.[4] H01L *21/306*; B44C *1/22*; C23F *1/02*; C03C *15/00*
U.S. Cl. 156—643 30 Claims



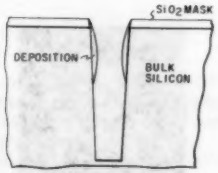
1. A process for patterning a resistive layer of a semiconductor device, comprising the steps of:

depositing an electrically resistive layer;
etching in dry plasma to remove an unmasked portion of said resistive layer;
etching in a wet bath to remove remnants of said unmasked portion;
whereby a vertical resistor is formed on said semiconductor device.

4,690,729
TAPERED TRENCH PROCESS

Monte A. Douglas, Coppell, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 730,701, May 3, 1985. This application Mar. 19, 1986, Ser. No. 841,391
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **28 Claims**

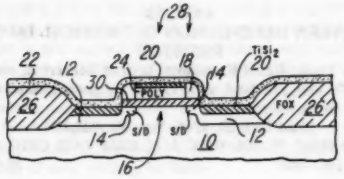


1. A process for etching trenches in silicon, comprising the steps of:
(a) providing a patterned mask over a silicon substrate;
(b) plasma etching exposed portions of said silicon substrate under etch conditions such that the material of said mask is forward sputtered to induce deposition on sidewalls of said trench during etching.

4,690,730
OXIDE-CAPPED TITANIUM SILICIDE FORMATION

Thomas E. Tang, Dallas; Che-Chia Wei, Plano; Roger A. Haken, Richardson; Thomas C. Holloway, and David A. Bell, both of Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 837,468, Mar. 7, 1986, which is a continuation-in-part of Ser. No. 729,318, May 1, 1985. This application Jun. 20, 1986, Ser. No. 876,947
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*
U.S. Cl. 156—643 **55 Claims**

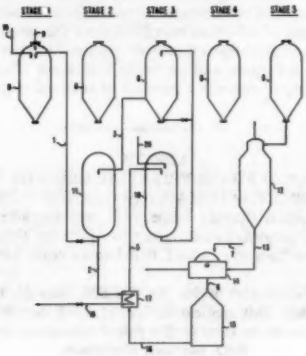


1. A method for fabricating integrated circuit devices, comprising the steps of:
(a) providing a substrate
having thereon a partially fabricated integrated circuit structure
including exposed portions consisting essentially of silicon;
(b) depositing overall a metal layer consisting predominantly of titanium;
(c) providing a dielectric layer directly overlying at least predetermined portions of said metal layer, said dielectric layer consisting predominantly of oxides; and
(d) applying heat until portions of said metal layer react with portions of said exposed silicon to form titanium silicides;
whereby said dielectric layer suppresses silicon outdiffusion through portions of said metal layer under said dielectric layer.

4,690,731
METHOD OF MAKING SULPHATE PULP

Nils J. C. Hartler, Lidingö ; Karl-Erik Lekander, Alingsås; Lars T. Sjödin, Solna, and Per J. Mjöberg, Ekerö, all of Sweden, assignors to Sunds Defibrator Aktiebolag, Sweden

Continuation of Ser. No. 482,879, Apr. 7, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 784,707
Claims priority, application Sweden, Apr. 28, 1982, 8202665
Int. Cl.[4] D21C *3/26, 11/00*
U.S. Cl. 162—45 **1 Claim**



1. A method of making sulfate pulp with a high degree of delignification from lignocellulose material in a batch digester, said method comprising the steps of cooking said lignocellulose material in said batch digester at a digester temperature in a first cooking phase utilizing a cooking liquor containing white liquor and black liquor to provide a free liquor having a first lignin content; displacing substantially all of said free liquor after said first cooking phase with a displacement liquor having a lower lignin content than said first lignin content and having substantially the same temperature as said digester temperature; thereafter cooking said lignocellulose material in the presence of said displacement liquor in a second cooking phase to provide a free liquor having a second lignin content from said lignocellulose material, separating the pulp from said free liquor having said second lignin content by washing and filtering to provide a filtrate, adding white liquor to said filtrate to form a composition of liquor, and utilizing said composition of liquor as said displacement liquor, said method including only two cooking phases as aforesaid, said displacing step being carried out when the lignocellulose material has been cooked to a yield of between about 50% and 54% in said first cooking phase.

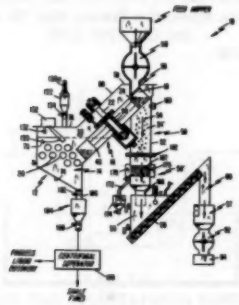
4,690,732
APPARATUS FOR SHALE OIL RETORTING

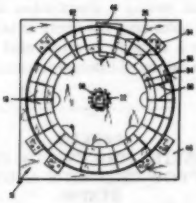
Wayne H. Everman, Vanceburg, and Joseph H. Gilbert, Quincy, both of Ky., assignors to Combs Enterprises, Inc., Alexandria, Va.

Continuation of Ser. No. 689,997, Jan. 9, 1985, abandoned, which is a division of Ser. No. 645,258, Aug. 29, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 842,729
Int. Cl.[4] C10B *1/10*
U.S. Cl. 202—100 **16 Claims**

1. A shale oil retorting system for retorting oil shale, comprising:

(a) a retort for containing a liquid bath;
(b) chute means for continuously feeding suitably sized particles of oil shale into said retort;
(c) container means including annular compartments respectively positionable below said chute means for receiving and containing said particles within the retort; and
(d) means connected to the container means for rotating said container means and continuously advancing said compartments without interrupting travel thereof from (1) a feed location below said chute means for loading said compartments with particles, to (2) an immersion location downstream of said feed location wherein said particles in said compartments are placed into intimate contact with said liquid bath to evolve product vapor from said particles and to (3) a discharge location downstream from the immersion location wherein spent shale particles are unloaded from the compartments and discharged from the





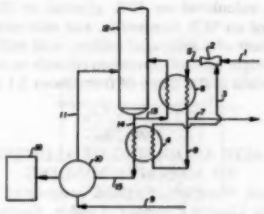
retort, wherein said retort includes body members joined to establish a retort housing, a lower portion of said housing containing said liquid bath, and inclined mounting means within an upper portion of said housing for supporting said container means within the housing for rotation along an inclined travel path between upper positions corresponding to said feed and discharge locations and a lower position corresponding to said immersion location, wherein said inclined mounting means includes a base plate forming an angle of greater than 90° with a horizontal reference plane, and wherein said container means includes a pair of generally cylindrical walls concentrically mounted for rotation on the base plate and connected to each other with dividers to define said annular compartments, said cylindrical walls being connected to a drive shaft rotatably mounted to said base plate, said drive shaft extending along an inclined axis about which said container means rotates.

4,690,733

PROCESS FOR THE SEPARATION OF HYDROCARBONS FROM A MIXED FEEDSTOCK

Paulino Forte, Yonkers, and Jose A. Videira, White Plains, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 4, 1985, Ser. No. 794,845
Int. Cl.[4] B01D *3/38, 11/00*
U.S. Cl. 203—21 **2 Claims**



1. In a combination solvent extraction-steam distillation process for the recovery of aromatic hydrocarbons, the improvement comprising
(a) introducing high pressure steam into a steam ejector;
(b) passing the steam from step (a) to a first heat exchanger where it exchanges heat with lean solvent coming from the bottom of a distillation column, which lean solvent has a temperature which is cooler than the steam temperature, and is condensed;
(c) returning the lean solvent from step (b) to the bottom of the distillation column;
(d) passing part of the condensate from step (b) to a second heat exchanger where it exchanges heat with the lean solvent coming from the bottom of the distillation column which lean solvent has a temperature which is warmer than the condensate temperature, cooling the lean solvent and vaporizing the condensate; and
(e) passing the vapor from step (d) to the steam ejector in step (a).

4,690,734

SEPARATION OF N-AMYL ACETATE FROM N-AMYL ALCOHOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, and An-I Yeh, both of 1314 S. Third Ave., Bozeman, Mont. 59715

Filed Nov. 25, 1985, Ser. No. 801,214
Int. Cl.[4] B01D *3/40;* **C07C** *67/48*
U.S. Cl. 203—56 **30 Claims**

1. A method for recovering n-amyl acetate from a mixture of n-amyl acetate, n-amyl alcohol and water which comprises distilling a mixture of n-amyl acetate, n-amyl alcohol and water in a rectification column in the presence of about one part of extractive agent per part of n-amyl acetate - n-amyl alcohol - water mixture, recovering n-amyl acetate and water as overhead product and obtaining the n-amyl alcohol and the extractive agent from the stillpot, the extractive agent comprises at least a glycol.

4,690,735

ELECTROLYTIC BATH COMPOSITIONS AND METHOD FOR ELECTRODEPOSITION OF AMORPHOUS CHROMIUM

Herbert A. Laitinen, Gainesville, Fla., and Shigeo Hoshino, Kawasaki, Japan, assignors to University of Florida, Gainesville, Fla.

Filed Feb. 4, 1986, Ser. No. 825,977
Int. Cl.[4] C25D *3/04*
U.S. Cl. 204—37.1 **13 Claims**

1. A composition of matter for electrodepositing an amor-

phous, bright chromium material having a hardness value above about 950 Hv comprising an aqueous solution containing:

(a) from about 20 to about 200 g/l of chromium trioxide (CrO_3),

(b) an amount of a source of formic acid, formaldehyde, glyoxal or formamide, sufficient to provide from about 2 to about 30 g/l of (1) a member selected from the group consisting of formic acid, calculated on 85% formic acid, (2) formaldehyde, calculated on 35% formaldehyde, (3) glyoxal, calculated on 40% glyoxal or (4) formamide, calculated on 98% formamide, and mixtures thereof, and

(c) an amount of a source of sulfuric acid sufficient to provide a weight ratio of chromium trioxide to sulfuric acid in said solution in the range of from about 2:1 to about 40:1.

4,690,736

CHROMIC ACID ANODIZING OF ALUMINIUM PRIOR TO ADHESIVE BONDING

Peter Albericci, Woodford, England, assignor to British Aerospace Public Limited Company, London, England

Filed Mar. 26, 1986, Ser. No. 844,151

Claims priority, application United Kingdom, Mar. 26, 1985, 8507761

Int. Cl.[4] C25D *5/00*

U.S. Cl. 204—38.3 **6 Claims**

1. A method of preparing an adhesively bonded aluminium or aluminium alloy structure comprising:

forming an environmentally stable adhesive receptive oxide layer on the surfaces of the articles to be adhesively bonded by anodising said articles in a bath containing an aqueous solution of chromic acid, the bath voltage being from at least 5 volts to about 30 volts, the concentration of chromic acid in solution lying in the range of 3% to 5% w/w, said solution being maintained at a temperature between at least 55° C. to about 62° C.; rinsing said articles to remove said solution,

applying an adhesive to said surfaces to be adhesively bonded and

bonding said articles together to form said adhesively bonded structure.

4,690,737

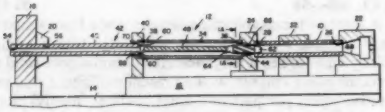
ELECTROCHEMICAL RIFLING OF GUN BARRELS

Alexander Vishnitsky, Henrietta, N.Y., assignor to Cation Corporation, Rochester, N.Y.

Filed Jun. 10, 1986, Ser. No. 872,704

Int. Cl.[4] B23H *3/10, 7/30, 7/36*

U.S. Cl. 204—129.7 **24 Claims**



24. A method for electrochemically rifling barrels comprising the steps of:

mounting an anode barrel and an elongate cam member extending therethrough in fixed coaxial relationship, said cam member having a spiral cam groove on its outer periphery;

slidably mounting an elongate hollow cathode rod rifling assembly on said cam member, said rifling assembly having a plurality of captive annular metallic segments interposed between the barrel and rod rifling assembly and defining a space therebetween, each segment having a plurality of circumferentially spaced, radially outwardly extending insulating strips and a radially inwardly extending depending follower lug insertable in said cam groove;

forcing an electrolyte fluid into the space between the inner surface of the barrel and the segments of said rifling assembly;

subjecting said anode barrel and said segments of said cathode rod rifling assembly to a power supply for generating current flow therebetween; and

pushing or pulling said rifling assembly relative to the barrel for moving said segments from one end of the barrel to the other for electrochemically rifling the barrel corresponding to the twist of the cam groove on said cam member.

4,690,738

METHOD OF ELECTROCHEMICALLY SURFACE TREATING CARBON FIBERS, FIBERS TREATED BY THE METHOD, AND COMPOSITE MATERIALS INCLUDING SUCH FIBERS

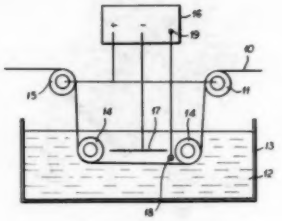
Georges Desarmot, Paris, and Manuel Sanchez, Villiers Le Bel, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed May 10, 1985, Ser. No. 733,227

Claims priority, application France, May 18, 1984, 84 07814

Int. Cl.[4] C25F *1/00*

U.S. Cl. 204—130 **9 Claims**



1. A method of treating the surface of carbon fibers to render them adherent to a synthetic resin comprising putting the fibers into contact with an aqueous solution of a basic electrolyte selected from the group comprising amine compounds and amide compounds having a dissociation degree of less than about 10^{-3}, and polarizing the fibers in said electrolyte positively relative to a cathode at a potential not exceeding 1.7 volts relative to a saturated calomel reference electrode in said electrolytes.

4,690,739

ELECTROLYTIC PROCESS FOR PRODUCING EXTREMELY LOW CHLORIDE ANION EXCHANGE RESINS

Babu R. Nott, 4144 Powderhorn Crescent, Mississauga, Ontario, Canada (L5L 3B9)

Continuation of Ser. No. 776,784, Sep. 17, 1985, abandoned. This application Oct. 27, 1986, Ser. No. 924,160

Int. Cl.[4] B01D *13/02*

U.S. Cl. 204—131 **9 Claims**

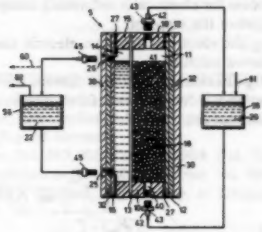
1. An electrolytic method for producing a strong base anion. exchange resin having an extremely low chloride concentration, comprising:

placing a resin having an undesirably high chloride concentration in a cathode cell of an electrolytic cell having an anode and a cathode, and having anode and cathode cells which are separated by an anion selective permeable membrane;

flowing an aqueous hydroxide catholyte through the resin containing cathode cell and flowing an anolyte through the anode cell whi1e applying a direct current across the cathode and anode thereby causing xigration of chloride ions from the resin through the xembrane and into the anode cell; and

removing chloride or chlorine gas from the anode cell

thereby reducing the concentration of chloride bound to the resin, and continuing the method for a sufficient time



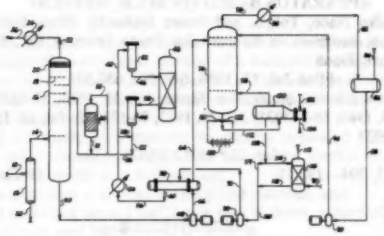
to reduce the chloride concentration of the resin to 20 to 300 μg chloride per gram of resin.

4,690,740

METHOD FOR MAINTAINING EFFECTIVE CORROSION INHIBITION IN GAS SCRUBBING PLANT

David C. Cringle, Angleton; Roscoe L. Pearce, Lake Jackson, and Michael S. DuPart, Alvin, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 7, 1986, Ser. No. 837,230
Int. Cl.[4] C23F *13/00*; B01D *53/34*
U.S. Cl. 204—147 **2 Claims**



1. In a process for the recovery of carbon dioxide from feed gases containing the same and oxygen in the presence or absence of sulfur compounds, by contacting the gas with a circulating alkanolamine solution which contains cooper in a plus 2 state as a corrosion inhibitor and threating said solution rich in CO_2 with heat to release the CO_2 thereby producing a lean solution and returning the so treated lean solution to the contacting step, the improvement which comprises

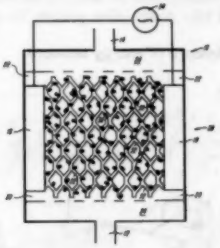
maintaining an amount of copper in the plus two state in said circulating solution effective to inhibit corrosion, inhibit plating out of said copper and/or reduce degradation of the solvent, by impressing a volume across two electrode in contact with the circulating solution to convert non-plus 2 state copper in said solution to the plus 2 valence state.

4,690,741

ELECTROLYTIC REACTOR AND METHOD FOR TREATING FLUIDS

Myles A. Walsh, III, Falmouth, and R. Scott Morris, Fairhaven, both of Mass., assignors to Cape Cod Research, Inc., Buzzards Bay, Mass.

Continuation of Ser. No. 660,123, Oct. 12, 1984, abandoned. This application Dec. 31, 1985, Ser. No. 815,665
Int. Cl.[4] C02F *1/46*
U.S. Cl. 204—149 **13 Claims**



1. A process for treating a solution containing organic compounds comprising:

(a) filling an electrochemical reactor with the solution to be treated, said electrochemical reactor comprising:

at least one pair of opposed main electrodes,

a plurality of auxiliary electrodes coated onto a plurality of tightly packed electrically insulating support structures for holding said auxiliary electrodes between said main electrodes;

electrocatalytic materials selected from a first group consisting of N_4 metal chelates comprising at least one phthalocyanine, porphyrin, or tetraazaannulene group and a metal center selected from the group consisting of iron, cobalt, osmium, and rthenium, a second group consisting of chemisorbed oxygen complexes comprising at least one carboxylic, quinonic, lactonic, or phenolic group, and mixtures thereof of said first and second groups, the electrocatalytic materials being disposed on the surface of said auxiliary electrodes; and

(b) applying an alternating current across said main electrodes;

(c) removing a treated solution depleted in organic compounds.

4,690,742

METHOD AND APPARATUS FOR LASER ISOTOPE SEPARATION

C. D. Cantrell III, and G. L. Peterson, both of Richardson, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Sep. 15, 1983, Ser. No. 533,528
Int. Cl.[4] B01D *59/34*
U.S. Cl. 204—157.2 **31 Claims**

1. A method of separating a selected isotope from a sample material comprising the steps of:

first, irradiating the sample with laser means for producing an adiabatic population inversion of said selected isotope at an excited state,

the pulse shape of the first irradiation having a particular rise time greater than t_m, where t_m equals:

$$t_M = \max_{E_o \leq E_{max}} \left\{ \max_{e} \frac{|\langle \lambda_e(E_o)|\Delta|\lambda_e(E_o)\rangle|}{[w_{eo}(E_o)]^2} \right\}$$

where

$|\lambda_o(E_o)>$

is the dressed state that evolves continuously from the ground state of the atom or molecule as the amplitude of the irradiation field is increased adiabatically from zero to E_o,

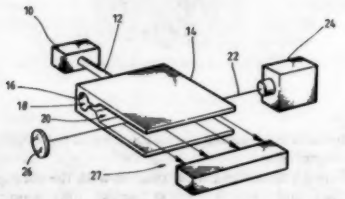
$|\lambda_e(E_o)>$

is the dressed state that evolves continuously from an excited state,

$hw_{oe}(E_o)$

is the difference of energy between

$|\lambda_o(E_o)>$



and

$|\lambda_e(E_o)>$

at the irradiating field amplitude E_o,

Δ

is a diagonal matrix, the diagonal elements of which in the basis of atomic or moleculr energy eigenstates in zero radiation field are

$$\Delta_{mm} = N(m)w - E_m/h$$

where

$$N(m) = \text{integer part}\left(\frac{E_m}{hw}\right)$$

w being the radiation frequenty and E_m being the energy of the atomic or molecular eigenstate in zero radiation field, and

E_{max}

is the radiation field amplitude at the instant when the pulse achieves its maximum intensity; and

second, irradiating the isotope while in said excited state with laser means to cause a transition of said selected isotope from said excited state.

4,690,743

METHOD FOR GAS SYNTHESIS

Don Ethington, Dimmitt; Ray J. Riley, Hart, and Richard W. Tock, Lubbock, all of Tex., assignors to AL-CHEM Fuels, Inc., Dimmitt, Tex.

Filed May 2, 1985, Ser. No. 729,567

Int. Cl.[4] C07C *3/24*

U.S. Cl. 204—168 **14 Claims**

1. A process involving

a. a fluid-tight tank,

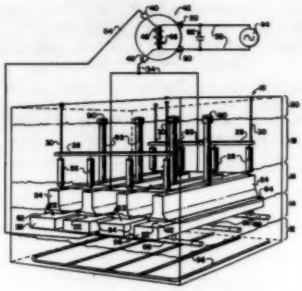
b. an insulative mixture that includes an electrically nonconductive liquid compound within the tank, and

c. an electrode disposed within the insulative mixture;

wherein a process for chemically reforming compounds within the tank comprises the steps of:

d. insulating the electrode from an electric conductor with the insulative mixture,

e. connecting alternating electrical current, having a voltage waveform and a current waveform, across the electrode and the conductor,



f. repetitively producing an arc between the electrode and the conductor with the alternating electrical current, until

g. establishing a stable plasma of partially ionized gases between the electrode and the conductor with the alternating electrical current,

h. placing a capacitor in electrical circuits connected to the electrode which modifies a phase difference between the voltage and current waveforms of the alternating electrical current connected across the electrode and conductor producing the plasma so that the power factor of the alternating electrical current approaches unity.

4,690,744

METHOD OF ION BEAM GENERATION AND AN APPARATUS BASED ON SUCH METHOD

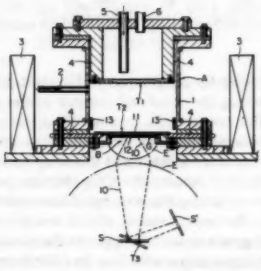
Masahiko Naoe, Tokyo, and Shozo Ishibashi, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1984, Ser. No. 630,514

Claims priority, application Japan, Jul. 20, 1983, 58-133030; Jul. 20, 1983, 58-133031; Jul. 20, 1983, 58-133032; Jul. 20, 1983, 58-133033

Int. Cl.[4] H01J *37/08*

U.S. Cl. 204—192.11 **19 Claims**



1. An ion beam generating method comprising generating plasma in a space between a plurality of opposing targets wherein at least one of said targets has first small holes made therethrough, producing ionized particles by sputtering said

targets, and leading said ionized particles outside said space in a predetermined direction through said first small holes by controlling the energy of said particles through the use of an electric field.

4,690,745

TARGETS FOR CATHODE SPUTTERING

Hans D. Klein, Darmstadt, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 569,696, Jan. 10, 1984, Pat. No. 4,647,548. This application Nov. 25, 1986, Ser. No. 934,978

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1983, 3300525

Int. Cl.⁴ C23C *14/00*

U.S. Cl. 204—192.29 **14 Claims**

1. In a process for coating a substrate by direct voltage sputtering thereon of a target, the improvement wherein the target is an oxide-ceramic composition comprising a hot-pressed indium oxide/tin oxide mixture of a density of at least 75% of the theoretical density and which has been diminished to such an extent in its oxygen content compared with the stoichiometric composition that it has an electric conductivity which corresponds to a specific resistance of 0.6 to 0.1 Ω·cm.

4,690,746

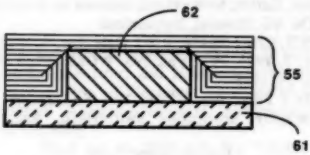
INTERLAYER DIELECTRIC PROCESS

Edward J. McInerney, Milpitas; E. Ronald Dornseif, Scotts Valley, and Norman E. Zetterquist, Santa Cruz, all of Calif., assignors to Genus, Inc., Mountain View, Calif.

Filed Feb. 24, 1986, Ser. No. 832,836

Int. Cl.⁴ B05D *3/06*; C23C *14/00*

U.S. Cl. 204—192.32 **6 Claims**



1. A method of producing a film over a wafer that has a topologically non-planar surface of a material having an RF sputter etch rate which is higher in a direction parallel to the plane of the wafer than perpendicular to the plane of the wafer, comprising the steps of:

(1) depositing said material by plasma enhanced chemical vapor deposition while simultaneously sputter etching said material as it is deposited;

(2) after step 1, sputter etching said material; and

(3) repeating steps 1 and 2 as a pair N times, where N is an integer and N≧1.

4,690,747

SELECTIVE PLATING APPARATUS

Mark L. Smith, and Richard M. Wagner, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 23, 1986, Ser. No. 946,467

Int. Cl.⁴ C25D *5/02, 17/00*

U.S. Cl. 204—206 **18 Claims**

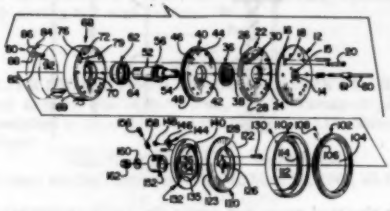
1. An apparatus for plating interior surfaces of electrical terminals that are spaced apart and attached to a carrier strip, that is utilized to strip feed the terminals, comprising:

a mandrel having first and second portions, said first portion being dielectric and mounted for rotation on a stationary conductive shaft as strip fed terminals are continuously fed to said first portion, wrapped against said first portion and exited therefrom, said first portion including a plurality of nozzles distributed about its axis of rotation, said second portion being conductive and mounted in a stationary position on said shaft;

a plurality of anode members mounted within said nozzles, said anode members being movable into and out of the interiors of the terminals that are against said first mandrel portion;

a conduit supplying plating solution under pressure through said nozzles and upon said anode members;

a source of electrical potential for supplying electrical current flow from said anode members, through said plating solution and into the interiors of said terminals, thus forming a plurality of plating cells about said first mandrel portion; and



means for providing an essentially uniform current to each of said plating cells, comprising a conductor member having one end electrically engaged and mechanically secured to a conductive portion of said anode member, a conductive member secured circumferentially around a forward portion of said dielectric first mandrel portion proximate said conductive second mandrel portion, said conductive member including a plurality of conductor member terminating apertures in which are disposed the other end of said conductor members, and means for electrically coupling said conductive second mandrel portion with said conductive member such that said conductive member may rotate while remaining in electrical engagement with said conductive second mandrel portion.

4,690,748

PLASTIC ELECTROCHEMICAL CELL TERMINAL UNIT

Richard N. Beaver, Angleton; Gregory J. Morris, Lake Jackson; John R. Pimlott, Sweeny, and Hiep D. Dang, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 16, 1985, Ser. No. 809,374

Int. Cl.⁴ C25B *9/04, 11/03*; H01R *11/00*; H01M *4/02*

U.S. Cl. 204—279 **24 Claims**

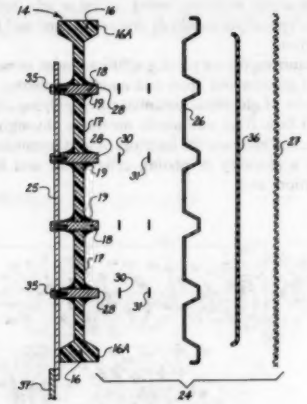
1. An article suitable for use as a terminal unit in monopolar or bipolar electrochemical cells comprising:

an organic, planar plastic member having a plurality of horizontally and vertically spaced-apart shoulders protruding outwardly from opposing generally coplanar surfaces of said planar plastic member;

at least one electrically conductive insert extending from an exterior face of a shoulder on a first surface of the planar plastic member, through the planar plastic member, to an exterior face of a shoulder on a second surface of the planar plastic member, wherein each of said shoulders annularly encircles and supports each of said inserts;

an electrically conductive, substantially completely hydraulically impermeable protective liner resistant to the corrosive effects of an electrolyte matingly contacted with the first surface of said planar plastic member and adapted to

minimize contact between an electrolyte and said planar plastic member; and



an electrical connection means electrically connected to at least a portion of the inserts at the second surface of the planar plastic member.

4,690,749

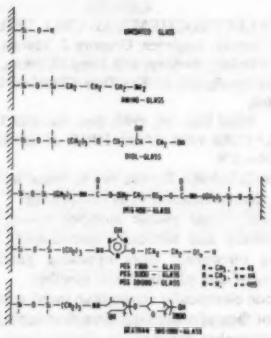
POLYMER-COATED SURFACES TO CONTROL SURFACE ZETA POTENTIAL

James M. Van Alstine, Montesano; J. Milton Harris, Huntsville; Steve Shafer, Huntsville; Robert S. Snyder, Huntsville, and Blair Herren, Arab, all of Ala., assignors to Universities Space Research Association, Washington, D.C.

Filed Dec. 16, 1985, Ser. No. 808,981

Int. Cl.[4] B01D *13/02*; C25D *13/00*

U.S. Cl. 204—299 R **26 Claims**



1. A method for eliminating or controlling electroosmosis and other zeta potential related phenomena in electrophoresis comprising conducting electrophoresis employing an electrophoretic surface coated with a monolayer of covalently bound hydrophilic, neutral polymers, provided that said polymers are not polymerized onto said surface.

4,690,750

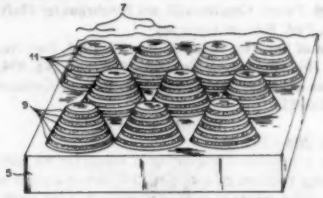
MICRO-POROUS SUPERLATTICE SEPARATIONS

Charles B. Roxlo, Bridgewater, and Harry W. Deckman, Clinton, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 13, 1986, Ser. No. 874,027

Int. Cl.[4] C07C *7/12*

U.S. Cl. 208—310 Z **10 Claims**



1. A process for absorbing a molecular species from a medium of a liquid or a gas comprising contacting said medium with a superlattice which includes multilayered material having layers which extend laterally with different dimensions so as to provide two dimensional slots between said layers within said multilayered material.

4,690,751

METHOD FOR SORTING OUT CERTAIN CONTAINERS, SUCH AS INDUSTRIAL CONTAINERS, BOTTLE CRATES ETC. FROM A STOCK OF CONTAINERS AND A DEVICE ON A CONTAINER FOR THE IDENTIFICATION OF A TO BE SORTED OUT CONTAINER

Hans Umiker, Zurich, Switzerland, assignor to Alexander Schoeller & Co. AG, Romont, Switzerland

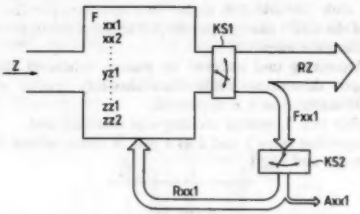
PCT No. PCT/CH84/00124, § 371 Date Apr. 3, 1985, § 102(e) Date Apr. 3, 1985, PCT Pub. No. WO85/00763, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 7, 1984, Ser. No. 723,963

Claims priority, application Switzerland, Aug. 8, 1983, 4303/83

Int. Cl.[4] B07C *5/34*

U.S. Cl. 209—3.3 **7 Claims**



1. Method for sorting out containers, such as bottle crates and industrial containers, from a stock of containers by means of optical detection, which comprises: providing a stock of containers with specific markings from which it can be noted if they belong to a common issue, whereby after being mixed up during use the containers of a common issue are brought together; optically detecting said markings; separating containers from said stock based on the optical detection of containers belonging to a common issue; further checking the separated containers at a further processing stage for reuseable containers; and returning said reuseable containers to a more recent common issue, wherein the marking is changed before returning separated items to said more recent common issue.

4,690,752

SELECTIVE FLOCCULATION PROCESS FOR THE RECOVERY OF PHOSPHATE

Douglas R. Shaw, Arvada, Colo., assignor to Resource Technology Associates, Boulder, Colo.

Continuation of Ser. No. 524,889, Aug. 19, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 719,343

Int. Cl.[4] B03D *3/06*

U.S. Cl. 209—5 6 Claims

1. A process for separating an upgraded phosphorus ore from an aqueous slurry containing said phosphorus ore comprising particles from about minus 20 to about minus 150 mesh, comprising:

(a) contacting the slurry at a pH of at least about 10 with a dispersing agent selected from the group consisting of sodium silicate, sodium hydroxide and polyacrylate in an amount sufficient to achieve dispersion in the slurry of substantially all the ore particles;

(b) contacting the dispersed mixture of step (a) with a flotation collector in an amount sufficient to coat and render hydrophobic substantially all the ore particles capable of being coated therewith;

(c) vigorously agitating the mixture of step (b) to achieve said coating;

(d) contacting the mixture of step (c) with a hydrophobic nonionic polyethylene oxide in an amount sufficient to cause the agglomeration of substantial portions of the fine particles of about minus 150 mesh;

(e) gently mixing the mixture of step (b) to provide dispersion of the polyethylene oxide of step (d) and form said agglomerates without significantly breaking up said agglomerates;

(f) subjecting the mixture of step (e) to froth flotation by the addition of gas bubbles thereto;

(g) separating the phosphorus-rich froth concentrate from the mixture of step (f).

4,690,753

COAL PROCESSING SETTLING MACHINE

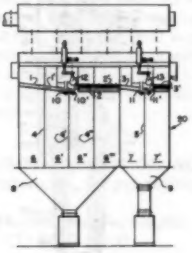
Alexander Lotz, Wetter, and Heinrich Stevermuer, Bochum, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 11, 1985, Ser. No. 753,914

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431653

Int. Cl.[4] B03B *11/00*

U.S. Cl. 209—496 5 Claims



1. A discharge device for the discharge of heavy matter from a fluid containing the heavy matter in a settling machine for the processing of coal and the like, comprising a vessel defining an interior having an upper portion with a plurality of settling bed wall portions, said vessel having an upper inflow opening for the inflow of fluid and for the passage of fluid in a flow direction along said settling bed wall portions, two discharge openings at the bottom of each settling bed wall portion, said two discharge openings for each settling bed wall portion being spaced apart in the flow direction, a valve member movable in each of said discharge openings for opening and closing each discharge opening for permitting the passage of heavy matter which has settled onto said settling bed wall portion to pass through said discharge opening, a control device connected to said valve members for moving said valve members to open and close said discharge openings for each settling bed wall portion, and a level-sensing element for each settling bed wall portion positioned above the downstream one of said discharge openings in said flow direction for each settling bed wall portion, for sensing the level of fluid in said upper portion of said vessel above said downstream one of said discharge openings for each settling bed wall portion, said level-sensing element being connected to said control device for each settling bed wall portion, for simultaneously moving said valve members to open both of said discharge openings for each settling bed wall portion.

4,690,754

FILTER DEVICE FOR A MINUTE VOLUME OF LIQUID

Kenji Koyama, and Shotaro Ohno, both of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Mar. 10, 1986, Ser. No. 837,836

Claims priority, application Japan, Mar. 12, 1985, 60-47533

Int. Cl.[4] B01D *13/01*

U.S. Cl. 210—94 6 Claims

1. A filter device for a minute volume of liquid in combination with means for applying pressure or centrifugal force, said filter device comprising a cylindrical member and a single hollow fiber filter having an open lower end and housed in said cylindrical member to form an annular space for containing a sample liquid around the filter, with the lower part of the hollow fiber filter liquid-tightly bonded to the inside wall of the lower part of the cylindrical member and with the upper end of the hollow fiber filter sealed, said hollow fiber filter being a microfilter having micro-scale pores observable only with an electron microscope or an ultrafiltration membrane.

4,690,755

ANAEROBIC CONTACTOR

Alexander A. Friedman, Fayetteville, N.Y., and Peter L. Podolak, Westminster, Md., assignors to Syracuse University, Syracuse, N.Y.

Continuation-in-part of Ser. No. 628,904, Jul. 9, 1984, Pat. No. 4,563,281. This application Oct. 24, 1985, Ser. No. 790,880

Int. Cl.[4] C02F *3/28*

U.S. Cl. 210—96.1 14 Claims

1. Apparatus for treating wastewater containing anaerobically digestible nutrients and organic substrates that includes

a gas tight reactor housing for containing a quantity of wastewater, said housing having a shaft rotatably mounted therein,

means to turn the shaft at a desired rate,

a plurality of spaced apart contactors affixed to the shaft for

supporting a biofilm of anaerobic organisms, said contactors being partially immersed in the wastewater whereby the biofile is passed in series through the wastewater and a headspace over the wastewater,

wastewater flow circuit for passing wastewater through the reactor housing,

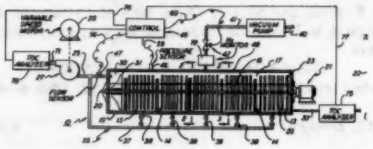
automatic detector means positioned in the wastewater flow circuit for determining the chemical oxygen demand loading on the reactor and providing an output signal and indicative of the loading, and

control means responsive to the output signal of the detector means for regulating the pressure in the headspace to maintain the reactor at a predetermined operating level.

10. Apparatus for treating wastewater containing anaerobically digestible nutrients and organic substrates that includes

a gas tight reactor housing containing a quantity of wastewater and having a shaft rotatably mounted in said housing,

means to drive the shaft at a predetermined rate,



a plurality of contactors spaced apart along said shaft for rotation therewith, each contractor supporting a biofilm of anaerobic organisms and is partially immersed in said wastewater so that the biofilm is passed sequentially through the wastewater and a headspace over the wastewater,

means for passing wastewater through said reactor housing at a desired rate,

a control valve operatively connected into the headspace over the wastewater for controlling the flow of head space gas out of the reactor,

a monitoring unit arranged to sense the concentration of hydrogen in the headspace gas and provide a data signal indicative thereof, and

control means operatively connected between the monitoring unit and the control valve for positioning said control valve in response to the concentration of hydrogen sensed in the headspace gas whereby the concentration of hydrogen in the reactor is held within desired limits.

4,690,756

APPARATUS FOR MICROAQUACULTURE AND POLLUTION CONTROL

Charles D. Van Ry, P.O. Box 4801, Annapolis, Md. 21403

Filed May 15, 1985, Ser. No. 734,090

Int. Cl.[4] B03D *1/24;* **C02F** *1/24*

U.S. Cl. 210—221.2 **7 Claims**

1. Apparatus for removing dissolved matter from a body of water in situ comprising:

a substantially hollow tube having a substantially open top and bottom, and a screen covering said open bottom;

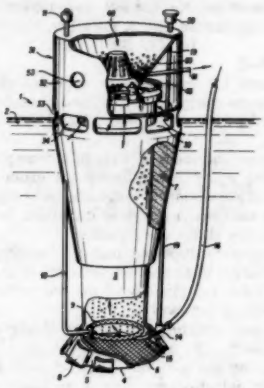
means for supporting said tube vertically in a body of water such that the top is disposed proximate the surface;

a source of compressed air;

air releasing means connected to the source of compressed air and disposed proximate the open bottom of the tube so that air released from the air releasing means will formula bubbles that rise within the tube and draw in water through the open bottom of the tube;

a baffle liftably supported on the top of the tube so that water, upwelling in the tube may lift the baffle and overflow the top of the tube, the baffle having an upper portion with at least one opening therein and being shaped to direct foam provided by the bubbles to the at least one opening;

reservoir means disposed around the baffle or receiving



foam passing through the at least one opening in the baffle; and

outlet means in communication with said reservoir means for removing said foam from said reservoir means.

4,690,757

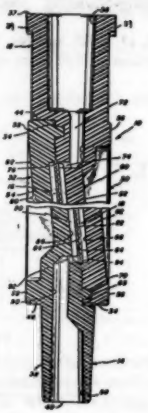
SMALL VOLUME LABORATORY FILTER

Gregory Mathus, Concord, Mass.; George Lyman, Cape Porpoise, Me., and Kevin Looney, Bedford, Mass., assignors to Costar Corporation, Cambridge, Mass.

Filed Mar. 21, 1986, Ser. No. 842,494

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—232 **16 Claims**



1. A small volume laboratory filter comprising

a thin rectangular body having opposed ends and connecting sides and opposite generally parallel faces,

means defining a shallow filter cavity extending over a major portion of the body's rectangular dimensions and having opposite side walls,

said cavity being inclined with one end lying closely adjacent one face of the rectangular body along one end thereof and the opposite end of the cavity lying closely

adjacent the other face of the body along the opposite end thereof,

an inlet sleeve connected to one end of the body and an outlet sleeve coaxial therewith connected to the other end thereof,

separate inlet and outlet manifolds connecting each sleeve to the cavity adjacent the respective ends, the respective connections to the cavity being through the opposite side walls,

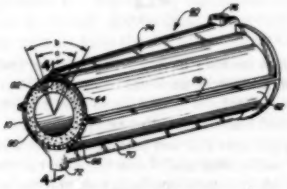
and a filter membrane bisecting the cavity and disposed parallel to the cavity side walls so that the manifold connections to the cavity from the inlet and outlet sleeves are disposed on opposite sides of the membrane.

4,690,758

MASS TRANSFER DEVICE

Ronald J. Leonard, Harvard, and Kenneth M. Johnson, Lindenhurst, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 5, 1984, Ser. No. 668,629
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—247 **6 Claims**



1. A mass transfer device comprising:

(a) a generally cylindrical hollow fiber bundle;

(b) a substantially cylindrical hollow housing enclosing said hollow fiber bundle, said housing having opposed first and second ends defining a second fluid inlet port and a second fluid outlet port, and a continuous sidewall;

(c) a first fluid inlet manifold projecting from said continuous sidewall of said housing, said first fluid inlet manifold having a first fluid inlet port projecting therefrom and being in fluid communication therewith; and

(d) a first outlet manifold projecting from said continuous sidewall of said housing, said first fluid outlet manifold having a first fluid outlet port projecting therefrom and being in fluid communication therewith, said first fluid outlet manifold including an expansion volume running substantially the entire length of said sidewall of said housing, said expansion volume allowing hollow fibers adjacent to said first fluid outlet manifold to migrate into said expansion volume during operation of said mass transfer device, thereby substantially alleviating void fraction decreases adjacent to said first fluid outlet manifold.

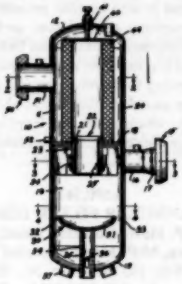
4,690,759

CENTRIFUGAL AND IMPINGEMENT OIL SEPARATOR

Zoltan A. Mandy, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Filed Oct. 14, 1986, Ser. No. 918,062
Int. Cl.[4] B01D *19/00*
U.S. Cl. 210—304 **9 Claims**

1. An oil separator comprising: means for use with an oil separation and return system for the compressor means of a refrigeration system including a vessel for receiving the relatively high pressure vapor-oil discharged from a compressor, said vessel having a receiving chamber with a cylindrical wall and a tangential inlet for connection to the compressor discharge conduit, oil outlet means at the lower end of said vessel, a turbine wheel rotatably mounted in said receiving chamber and positioned in line with said tangential inlet for receiving the impact of refrigerant vapor thereon, said turbine wheel having vanes on its exterior portion and a central portion that is open for the passage of vapor, a flow reverter mounted in spaced relation beneath said turbine wheel, said flow reverter comprising plate means extending laterally of said vessel and spaced from the wall thereof for enabling oil to freely flow downwardly of said wall but vapor flow is deflected upwardly towards the central portion of said turbine wheel, said vessel having a vapor discharge chamber above said receiving chamber and sealed therefrom except for the central portion of said turbine wheel, said discharge chamber having a vapor outlet,



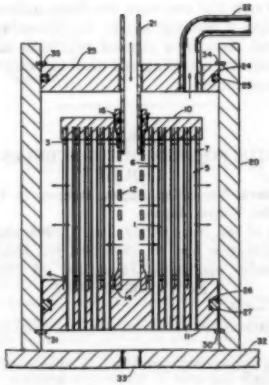
said flow reverter being positioned for causing substantially oil-free vapor to be deflected upwardly through the central portion of said turbine wheel for passage through said outlet directly to a filter means, and said turbine wheel being driven by the relatively high pressure refrigerant vapor-oil at a rapid rate, the oil in said vapor impinging thereon and being thrown outwardly into contact with the side walls of the vessel and draining downwardly to the oil outlet means sufficient that the oil is separated from the vapor and the vapor flows through the vessel to the vapor outlet.

4,690,760

NOVEL CARTRIDGE WITH STRESS RELIEVING MEMBER

Michael A. Smoot, Oakmont; Herbert W. Barch, Natrona Heights, and Baibhadra Das, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 637,233, Aug. 28, 1984, abandoned. This application May 7, 1986, Ser. No. 860,394
Int. Cl.[4] B01D *13/01*
U.S. Cl. 210—321.5 **21 Claims**



1. A cartridge suitable for use in a fluid separation system

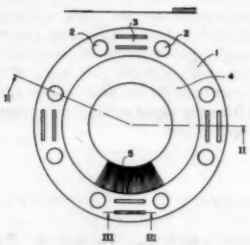
comprising a solid, top member having an opening therein, a fluid distributor tube having one end extending through said opening and extending along an axis of said cartridge, said distributor tube having a plurality of openings along its length and having another end embedded in a solid, bottom member sealing it therein, a mat of fluid permeable sheet having a plurality of glass fibers affixed thereto positioned around said distributor tube in successive wraps to provide alternate layers of fluid permeable sheets and glass fibers from the distributor tube to the outside of the cartridge, said glass fibers being oriented in parallel to the distributor tube and to each other and wherein the fibers are embedded in said top member below its upper surface and in said bottom member, said fibers being opened to the atmosphere at the lower surface of said bottom member, means positioned around said distributor tube in the said opening in said top member and surrounding said distributor tube in said opening to thereby provide a sliding surface on which the said top member may move downwardly on said tube in response to changes in the length of the said fibers caused by shrinkage thereof during operation.

4,690,761

ANNULAR FILTER DISC

Itzhak Orlans, M.P. Hevel Korazim, Israel, assignor to Amida Sinun Vehashkaya, M.P. Hevel Korazim, Israel

Filed Feb. 10, 1986, Ser. No. 828,556
Claims priority, application Israel, May 7, 1985, 75110
Int. Cl.[4] B01D *29/46*
U.S. Cl. 210—330 **4 Claims**



1. A tubular filter stack comprising a stack of annular filter discs; a plurality of angularly spaced apart springy spacer projections formed integrally with a first surface of each disc so as to abut a second and opposite surface of a successive disc for enabling compression of said discs into close juxtaposition one with the other during a filtering cycle and for enabling expansion of said disc one from the other sufficient to enable flushing during a flushing mode; disc mounting means for mounting said discs in a stacked condition and releasable clamping means for clamping said discs together so as to compress said projections.

4,690,762

APPARATUS FOR REMOVING BUBBLES FROM A LIQUID

Yoshiro Katsura, Narashino, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 618,058, Jun. 7, 1984, abandoned. This application Apr. 18, 1986, Ser. No. 854,679
Claims priority, application Japan, Jun. 10, 1983, 58-102726
Int. Cl.[4] B01D *19/02*
U.S. Cl. 210—436 **7 Claims**

1. An apparatus for removing bubbles from a liquid, comprising:

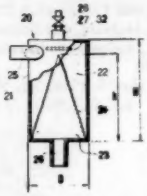
a generally cylindrical vessel having an axis and a cylindrical inner wall;

a substantially conically shaped filtration member disposed in said vessel coaxially therewith, said filtration member dividing the space in said vessel into a liquid inlet space and a liquid outlet space;

a liquid inlet port formed in a wall of said vessel in communication with said liquid inlet space for introducing a liquid into said liquid inelt space in the form of a vortex flow around the axis of said vessel;

a liquid outlet port formed in the wall of said vessel in communication with said liquid outlet space for adapting the treated liquid passed through said filtration member to be discharged therethrough; and

a gas outlet port formed in the wall of said vessel in communication with an uppermost region of said liquid inlet space for allowing the gas of the separated bubbles to be discharged therethrough;



said filtration member having an upper apex end and a bottom end, said upper apex end being positioned at substantially the same level as said liquid inlet port, the filtration area of said filtration member being reduced in the vicinity of its upper apex end and increasing in the axial direction toward said bottom end of asid filtration member in accordance with its conical configuration, and the radial separation between the periphery of said filtration member and said inner wall of said vessel increasing in the axial direction thereof from said bottom end toward sasid upper apex end by an amount sufficient to allow separation of bubbles from said vortex flow of said liquid in said liquid inlet space.

4,690,763

FILTER MEDIUM IN THE FORM OF A STABLE POROUS BODY

Wolfhart Rieger, Buch; Ludwig Gauckler, Schaffhausen; Albert Maurer, Thayngen, and Konrad Kampfer, Thayngen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 426,902, Sep. 29, 1982, abandoned. This application Aug. 15, 1985, Ser. No. 766,053
Int. Cl.[4] B01D *39/20*
U.S. Cl. 210—496 **18 Claims**

1. A filter plate constructed and arranged for filtering molten metal in the form of a stable porous body of hollow spherical ceramic granules of fire-resistant material which are bonded together, said granules having a mean diameter of from 0.5 mm to 8 mm and are thermally bonded together such that the surface area of the point contact between any two granules is from 0.1% to 1.5% the surface area of the granules, said filter plate being characterized by a width to thickness ratio of from 1:1 to 25:1, an apparent density of 16 to 25 percent the density of the ceramic material, a through flow porosity of 20 to 35 percent by volume and a permeability of 10 μPm to 30 μPm.

4,690,764

AERATOR AND AEROBIC BIOLOGICAL TREATMENT PROCESS USING SAME

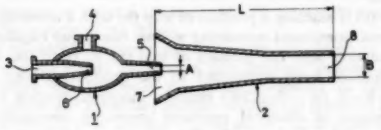
Munehiro Okumura, Hoya; Takao Nomura, Matsudo; Tadashi Matsuda; Shojiro Kido, both of Yokohama; Shinichi Ishii, Hachiouji, and Hideki Hattori, Tokyo, all of Japan, assignors to Mitsubishi Rayon Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1986, Ser. No. 916,730

Claims priority, application Japan, Oct. 11, 1985, 60-224802

Int. Cl.[4] C02F *3/20*

U.S. Cl. 210—629 7 Claims



1. An aerator comprising a jet stream generator for ejecting a gas and a liquid in a mixed state from a nozzle, and a tubular flow straightener for mixing the bubble-containing stream ejected from the nozzle with ambient water and discharging the resulting mixture from the discharge orifice thereof, characterized in that said jet stream generator has a liquid inlet, at least one gas inlet, an outer nozzle and at least one inner nozzle, said liquid inlet communicates with the internal space of said jet stream generator by way of said inner nozzle, said flow straightener has a tubular form whose internal diameter is reduced from the inlet toward the discharge orifice through at least a part of its length, and said outer nozzle is disposed so as to be substantially coaxial with said flow straightener and to have its tip located in the neighborhood of the inlet of said flow straightener.

7. A process for the aerobic biological treatment of waste water placed in a tank which comprises the steps of

(a) providing an aerator comprising a jet stream generator for ejecting a gas and a liquid in a mixed state from a nozzle, and a tubular flow straightener for mixing the bubble-containing stream ejected from the nozzle with ambient water and discharging the resulting mixture from the discharge orifice thereof, characterized in that said jet stream generator has a liquid inlet, at least one gas inlet, an outer nozzle and at least one inner nozzle, said liquid inlet communicates with the internal space of said jet stream generator by way of said inner nozzle, said flow straightener has a tubular form whose internal diameter is reduced from the inlet toward the discharge orifice through at least a part of its length, and said outer nozzle is disposed so as to be substantially coaxial with said flow straightener and to have its tip located in the neighborhood of the inlet of the flow straightener;

(b) installing said aerator within said tank in such a way that said aerator is located at a depth of at least 2 meters below the water surface and the discharge orifice of said flow straightener is located at a distance of not less than 3 meters from the opposite wall of said tank as measured in the direction of flow of the bubble-containing stream discharged from said discharge orifice;

(c) disposing two partitions within said tank in such a way that said partitions are substantially parallel to the bubble-containing stream discharged from said discharge orifice, said partitions define a section having a width of not greater than 5 meters, and said aerator is located substantially equidistant from said partitions; and

(d) supplying a gas and a liquid to said aerator so as to produce a bubble-containing stream having a flow velocity of not less than 1.5 meters per minute at said discharge orifice.

4,690,765

CHEMICALLY MODIFIED SEMIPERMEABLE MEMBRANES AND THEIR USE IN REVERSE OSMOSIS AND ULTRAFILTRATION

Charles Linder, Rehovot; Gershon Aviv, Tel Aviv; Mordechai Perry, Petach Tikvah, and Reuven Kotraro, Rehovot, all of Israel, assignors to Aligena AG, Basel, Switzerland

Continuation of Ser. No. 411,066, Aug. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 355,509, Mar. 8, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,321

Claims priority, application Switzerland, Mar. 17, 1981, 1809/81

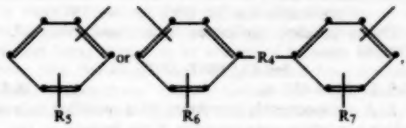
Int. Cl.[4] B01D *13/00, 13/04*

U.S. Cl. 210—654 27 Claims

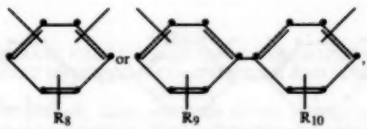
1. A semipermeable membrane of a modified polysulfone, which comprises repeating units of the formula

$$—M_1—R_1—M_2—R_2—SO_2—R_3— \quad (1)$$

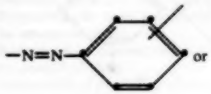
wherein M_1 and M_2 are independently a valence bond, —O— or —NH—, R_1 is a valence bond or a group of the formula

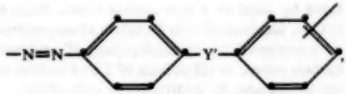


with the proviso that if R_1 is a valence bond, only one of M_1 and M_2 can be —O—, R_2 and R_3 are independently a group of the formula



the aryl groups of R_1, R_2 and R_3 are optionally further substituted by alkyl of 1 to 4 carbon atoms, R_4 is a valence bond —O—, alkylene of 1 to 4 carbon atoms optionally substituted or interrupted by cycloalkyl(ene) or aryl(ene) of at most 7 carbon atoms, or alkylidene of 2 to 4 carbon atoms, R_5 to R_{10} are independently hydrogen, or $—R_{11}NH_2$ or $—R'_{13}OH$ radicals, wherein R_{11} and R'_{13} each being





Y' being a valence bond, —O— or —NH—, these radicals being modified through a sequence of chemical reactions consisting essentially of steps (a) and (c), wherein:

step (a) is reacting said radicals with a monomeric compound containing at least two functional groups, to bond $—R_{11}NH—$ or $—R'_{13}O—OH$ said radicals to one of the functional groups of the monomeric compound,

step (b) is reacting a product of step (a) with a polyfunctional, linear or branched oligomer or polymer, to bond an available functional group of the monomeric compound to

one of the functional groups of the oligomer or polymer, and

step (c) is reacting a product of step (b) with at least one member selected from the group consisting of a non-ionic compound and an ionic compound containing at least one group capable of reaction with the product of step (b), to bond the non-ionic compound, ionic compound or both compounds to the product of step (b), a degree of substitution of substituents R_5 to R_{10}—different from hydrogen—being between 0.05 and 3.5 milliequivalents/g.

4,690,766

CHEMICALLY MODIFIED SEMIPERMEABLE POLYSULFONE MEMBRANES AND THEIR USE IN REVERSE OSMOSIS AND ULTRAFILTRATION

Charles Linder, Rehovot; Gershon Aviv, Tel Aviv; Mordechai Perry, Petach Tikvah, and Reuven Kotraro, Rehovot, all of Israel, assignors to Aligena AG, Basel, Switzerland

Continuation of Ser. No. 355,509, Mar. 8, 1982, abandoned. This application Jul. 22, 1985, Ser. No. 757,911

Claims priority, application Switzerland, Mar. 17, 1981, 1809/81

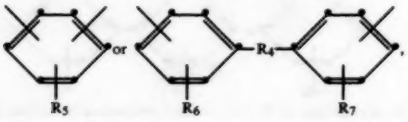
Int. Cl.[4] B01D *13/00, 13/04*

U.S. Cl. 210—654 **26 Claims**

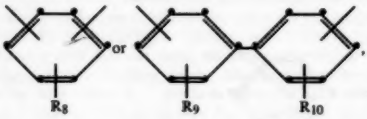
1. A semipermeable membrane of a modified polysulfone which comprises repeating units of the formula

$$—M_1—R_1—M_2—R_2—SO_2—R_3— \quad (1)$$

wherein M_1 and M_2 are independently a valence bond, —O— or —NH—, R_1 is a valence bond or a group of the formula



with the proviso that if R_1 is a valence bond, only one of M_1 and M_2 can be —O—, R_2 and R_3 are independently a group of the formula



the aryl groups of R_1, R_2 and R_3 are optionally further substituted by alkyl of 1 to 4 carbon atoms, R_4 is a valence bond, —O—, alkylene of 1 to 4 carbon atoms optionally substituted or interrupted by cycloalkyl(ene) of aryl(ene) of at most 7 carbon atoms, or alkylidene of 2 to 4 carbon atoms, R_5 to R_{10} are independently hydrogen, or $—R_{11}NH_2$,

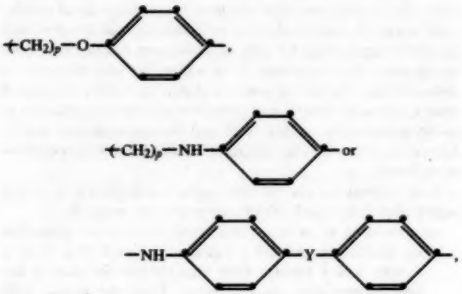
or $—R_{13}OH$ radicals, these radicals being modified through a sequence of chemical reactions consisting essentially of steps (a) to (c), wherein:

step (a) is reacting said radicals with a monomeric compound containing at least two functional groups, to bond the $—R_{11}NH—$,

or $—R_{13}O—$ of said radicals to one of the functional groups of the monomeric compound,

step (b) is reacting a product of step (a) with a polyfunctional, linear or branched oligomer or polymer, to bond an available functional group of the monomeric compound to one of the functional groups of the oligomer or polymer and

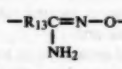
step (c) is reacting a product of step (b) with a non-ionic or ionic compound containing at least one group capable of reaction with the product of step (b), to bond the non-ionic or ionic compound to the product of step (b), $—R_{12}X$ or $—R_{13}CHO$ radicals, modified through a sequence of chemical reactions consisting essentially of steps (b) and (c), or $—R_{13}CN$ radicals, modified through a sequence of chemical reactions consisting essentially of reacting said $—R_{13}CN$ radicals with hydroxylamine to form an amidoxime group, followed by steps (a), (b) and (c), R_{11} is a valence bond, $—CH_2—$, $—(CH_2)_pNH(CH_2)_{2-6}$, $—(CH_2)_p—O—(CH_2)_{2-6}$,



R'_{11} constitutes atoms necessary to form an imidazolone ring condensed with a polymer backbone consisting of the repeating units of the formula (1), R_{12} is $—C_nH_{2n}$, R_{13} is a valence bond or $—C_mH_{2m}$, Y is —O—, $—SO_2—$ or

X is halogen, m is an integer of 1 to 5 and n is an integer of 1 to 6, p is zero of 1, wherein said membrane contains at least one radical selected from the group consisting of $—R_{11}NH—$,

$—R_{12}—$, $—R_{13}O—$, $—R_{13}CH=$ and



a degree of substitution of substituents R_5 to R_{10}—different from hydrogen—being between 0.3 and 3.5 milliequivalents/g.

4,690,767

HYDROGEN SULFIDE STABILIZED OIL-SOLUBLE SULFURIZED ORGANIC COMPOSITIONS

Stephen A. DiBiase, Euclid, and James N. Vinci, Mayfield Heights, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 712,587, Mar. 15, 1985. This application Aug. 11, 1986, Ser. No. 879,243

Int. Cl.[4] C10M *135/02, 141/06*

U.S. Cl. 252—47 8 Claims

1. A metal working fluid, comprising:

a major amount of an oil of lubrication viscosity;

an oil-soluble sulfurized organic compound present in an amount of about 0.1% to about 10% by weight based on the weight of the fluid;

an oil-soluble hindered organic amine structured so as to provide stearic hinderance, said hindered organic amine being selected from the group consisting of primary amines and secondary amines wherein the hindered amine is present in an amount of from about 0.25% to about 2% by weight based on the weight of the sulfurized organic compound.

4,690,768

PROCESS FOR THE PREPARATION OF FERRITE MAGNETIC PARTICULATE FOR MAGNETIC RECORDING

Kouzi Kamiyama, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 580,161, Feb. 14, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,476

Claims priority, application Japan, Feb. 16, 1983, 58-24255

Int. Cl.[4] C04B *35/26*

U.S. Cl. 252—62.58 6 Claims

1. A process for the preparation of a magnetoplumbite type ferrite magnetic particulate for magnetic recording which comprises the steps of:

(1) melting a starting material mixture containing a basic component for hexagonal ferrite comprising Fe_2O_3 and RO, wherein R is at least one metal atom selected from the group consisting of barium, strontium and lead, a coercive force reducing component comprising MO and $M'O_2$, wherein M is at least one divalent metal atom selected from the group consisting of cobalt, nickel and zinc and M' is at least one tetravalent metal atom consisting of titanium, zirconium and hafnium, and a glass-forming component comprising B_2O_3 and SiO_2,

(2) rapidly cooling the resulting molten mixture to obtain an amorphous material,

(3) heat-treating said amorphous material to form ferrite crystals, and

(4) removing components other than the ferrite crystals from the material resulting from said heat-treatment;

characterized in that a step for pulverizing said amorphous material under application of shearing force and pressure to give particles passing through a sieve of 170 mesh is included in advance of the step (3) for heat-treating said amorphous material to form ferrite crystals.

4,690,769

HYDRATED CALCIUM BROMIDE REVERSIBLE PHASE CHANGE COMPOSITION

George A. Lane, and Harold E. Rossow, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 8, 1986, Ser. No. 894,592

Int. Cl.[4] C09K *5/06*

U.S. Cl. 252—70 15 Claims

13. A method of storing thermal energy, comprising the steps of preparing a reversible liquid/solid phase change composition by admixing $CaBr_2$ and water to form a eutectic composition of $CaBr_2.6H_2O$ and $CaBr_2.4H_2O$ having more than 5.4 but less than 6.0 moles of water per mole of $CaBr_2$, introducing the composition into an encapsulating means for use as a heat storage device, and hermetically sealing the encapsulating means to prevent evaporation of water from the composition.

4,690,770

BLOCK-FORM DETERGENT FREE FROM ALKALI HYDROXIDES FOR USE IN DISHWASHING MACHINES AND A PROCESS FOR ITS PRODUCTION

Peter Jeschke, Neuss; Theodor Altenschoepfer, Duesseldorf; Jochen Jacobs, Wuppertal, and Klaus Schumann, Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Fed. Rep. of Germany

Filed May 29, 1986, Ser. No. 868,913

Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519354

Int. Cl.[4] C11D *7/18*

U.S. Cl. 252—99 20 Claims

1. A storage stable detergent in the form of fused blocks made from a liquid melt free of alkali metal hydroxide for use in dishwashing machines containing from about 65 to about 85% by weight, based on the weight of the detergent, of a mixture of alkali metal silicates and pentaalkalitriphosphates, said silicates being present in an amount of between about 5 and about 60% by weight, and being selected from sodium metasilicate nonahydrate, sodium metasilicate hexahydrate, sodium metasilicate pentahydrate, sodium metasilicate anhydrous, and mixtures thereof, and homogeneously distributed throughout said detergent from about 0.2 to about 4% by weight of a chlorine donor.

4,690,771

PHOSPHATE FREE NONAQUEOUS LIQUID NONIONIC LAUNDRY DETERGENT COMPOSITION AND METHOD OF USE

Trazollah Ouhadi, Liège, and Louis Dehan, Seraing, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,164

Int. Cl.[4] C11D *1/74, 3/12, 3/43, 3/39*

U.S. Cl. 252—102 20 Claims

16. A phosphate detergent builder free nonaqueous liquid heavy duty laundry detergent composition which comprises

Nonionic surfactant in an amount of about	30–40%
Polycarboxylic Acid Terminated nonionic surfactant in an amount of about	4–10%
Sodium salt of nitrilotriacetic acid (NTA) builder in an amount of about	5–15%
Sodium salt of crystalline aluminosilicate zeolite in an amount of about	15–20%

4,690,772

STERILANT COMPOSITIONS

Elaine N. Tell, Fort Lee, N.J., and Preston L. Veltman, Severna Park, Md., assignors to National Medical Care, Rockleigh, N.J.

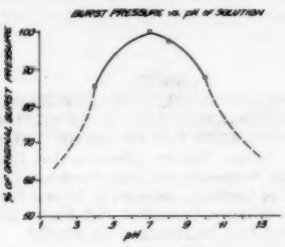
Filed Jun. 3, 1985, Ser. No. 740,643

Int. Cl.[4] C11D *3/48*

U.S. Cl. 252—106 2 Claims

1. A dry, granular, solid, water soluble, biocompatible, sterilant cleansing composition suitable for cleansing hemodialysis apparatus for reuse comprising by weight, 56.8 grams of so-

dium chlorite, 11.6 grams of citric acid and 151.4 grams of sodium bicarbonate, said composition being isotonic and having a pH of approximately 7.3 when dissolved in five gallons of water.



4,690,773

MICROBIAL ENZYMATIC CONTACT LENS CLEANER AND METHODS OF USE

Lai Ogunbiyi, Fairport, and Francis X. Smith, Walworth, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 690,372, Jan. 9, 1985, abandoned, which is a continuation of Ser. No. 545,315, Oct. 24, 1983, abandoned. This application May 7, 1986, Ser. No. 861,741

Int. Cl.[4] B08B *3/08*

U.S. Cl. 252—174.12 8 Claims

1. A method of cleaning an extended wear contact lens, which comprises contacting the lens for less than 2 hours with an effective amount of an activator-free, non-malodorous enzyme-containing solution comprising an aqueous solution containing a protease prepared by dissolution in aqueous solution of a contact lens cleaning tablet comprising from about 0.01 mg. to about 500 mg. of a protease derived from a Bacillus, Streptomyces, or Aspergillus microorganism.

4,690,774

NOVEL TRANSLUCENT WATER IN OIL EMULSIONS

Mohan Vishnupad, Monroe, and Jose E. Ramirez, Trumbull, both of Conn., assignors to Chesebrough Pond's Inc., Greenwich, Conn.

Filed Sep. 11, 1985, Ser. No. 774,727

Int. Cl.[4] B01J *13/00*

U.S. Cl. 252—309 10 Claims

1. A translucent water-in-oil emulsion having the same general appearance and feel as petroleum jelly comprising an aqueous phase, said aqueous phase comprising water in an amount from 8% to 20% by weight of the total composition and a humectant in an amount from about 15% to 30% by weight of the total compositon, an oil phase in an amount of about 50% to 77% by weight, said oil phase comprising petroleum jelly in an amount from about 40% to 70% by weight of the total composition and a water-in-oil emulsifying agent in an amount needed to form the water-in-oil emulsion, said aqueous phase having a refractive index in essentially the same range as the oil phase to produce the translucent water-in-oil emulsion.

4,690,775

EMULSION-BASED GEL AND PROCESS FOR PREPARING SAME

Hans Schott, and Alan E. Royce, both of Philadelphia, Pa., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 537,980, Sep. 30, 1983, abandoned. This application Apr. 25, 1985, Ser. No. 726,923

Int. Cl.[4] B01J *13/00*

U.S. Cl. 252—312 32 Claims

1. A method for preparing a transparent gel which comprises centrifuging an emulsion comprising a substantially oleophilic, hydrophobic liquid component constituting the dispersed phase in a substantially aqueous medium containing an emulsifying amount of emulsifying agent which is soluble therein at its level of concentration but which is substantially insoluble in the oleophilic, hydrophobic component, the emulsion being devoid of gelling agent, to separate the emulsion into a transparent gel phase containing substantially all of the oleophobic component of the emulsion and a clear aqueous phase, said oleophilic, hydrophobic liquid component being a liquid organic material having at most low or slight solubility in water and/or other polar solvent and said organic material being an edible fat, edible oil, liquid paraffin, aliphatic hydrocarbon or derivative thereof, aromatic hydrocarbon or derivative thereof, essential oil, or mixtures thereof and said emulsifying agent being a nonionic surface active agent having an HLB number of from about 8 to about 18 or an ionic surface active agent.

4,690,776

METHOD OF MANUFACTURE OF A TOOTHPASTE COMPOSITION

Irwin E. Smigel, 635 Madison Ave., New York, N.Y. 10022

Division of Ser. No. 706,001, Feb. 27, 1985, Pat. No. 4,603,045. This application Jan. 8, 1986, Ser. No. 817,043

Int. Cl.[4] A61K *7/18;* B01J *13/00*

U.S. Cl. 252—315.3 7 Claims

1. A method of preparing a toothpaste composition comprising adding calcium phosphate in an amount of 0.5 to 5% by weight of the composition and sodium perborate in an amount of 0.5 to 5% by weight of the composition to hot water to form a first mixture and agitating the first mixture, adding to said first mixture sorbitol in an amount of 1 to 50% by weight of the composition, cornstarch in an amount of 0.5 to 10% by weight of the composition and aluminum hydroxide in an amount of 0.01 to 1% by weight of the composition to form a second mixture and agitating the second mixture, adding to said second mixture dicalcium phosphate in an amount of 1 to 50% by weight of the composition and sodium monofluoride phosphate in an amount of 0.7 to 0.8% by weight of the composition to form a third mixture and agitating the third mixture, adding to the third mixture sodium bicarbonate, in an amount of 1 to 50% by weight of the composition, gradually adding increments of a flavoring material in an amount of 0.05 to 2% to control any foaming and to facilitate release of gases to form a fourth mixture, and adding to the fourth mixture sodium lauryl sulfoacetate in an amount of 0.1 to 5% and gum in an amount of 0.5 to 5% and agitating the fourth mixture until a homogeneous paste composition is obtained.

4,690,777

PRODUCTION OF SYNTHESIS GAS

Louis J. Valenyi, Lyndhurst; Frederick A. Pesa, Aurora, and Christos Paparizos, Willowick, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 336,533, Jan. 4, 1982, abandoned. This application Nov. 2, 1983, Ser. No. 548,104

Int. Cl.[4] C01B *3/38, 3/40*

U.S. Cl. 252—373 12 Claims

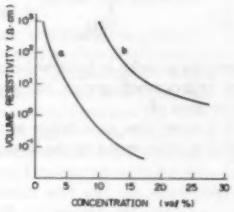
1. A process for reforming light hydrocarbons selected from the group consisting of olefins having from 2 to about 4 carbon atoms and paraffins having from 1 to about 4 carbon atoms, to a product gas mixture containing at least carbon monoxide and hydrogen comprising contacting the light hydrocarbons with carbon dioxide in the presence of a catalytic amount of a catalyst comprising a porous catalyst support having a surface area greater than 1 to less than about 350 m^2/gm and a pore volume of about 0.4 to about 3 cc/gm and at least one Group VIII metal or mixture thereof on a pore surface of the support in the absence of steam.

4,690,778

ELECTROMAGNETIC SHIELDING MATERIAL

Yoshikazu Narumiya; Yasuo Hashimoto, both of Chiba; Hiroshi Yui, and Yoshiteru Kageyama, both of Mie, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed May 20, 1985, Ser. No. 735,955
Claims priority, application Japan, May 24, 1984, 59-103669
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—506 7 Claims



1. An electromagnetic shielding material for forming a sheet having electromagnetic absorbing property, the said material comprising a composition in which MN-ZN ferrite powders and conductive carbon black powders are dispersed in a matrix of organic high molecular weight compounds, the content of the MN-ZN ferrite powders being in the range between 30 and 70 vol percent, the content of the carbon black powders being in the range between 1 and 12 vol percent, the composition having a volume resistivity in the range between 100 and 1/10 ohm/cm, and the carbon black powders having the specific surface of more than 900 m^2/g.

4,690,779

HARD SURFACE CLEANING COMPOSITION

Harold R. Baker, Pleasanton; Eugene S. Thrower, Oakland, and David C. Simpson, Indio, all of Calif., assignors to The Clorox Company, Oakland, Calif.

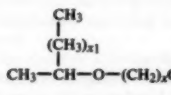
Continuation of Ser. No. 505,038, Jun. 16, 1983, abandoned. This application Dec. 30, 1985, Ser. No. 815,664
Int. Cl.[4] C11D *1/75, 3/37*
U.S. Cl. 252—546 2 Claims

1. A substantially non-streaking, aqueous hard surface cleaning compositin comprising:

(a) approximately 0.05% to 25.0% by weight of a C_{10-14} amine oxide or a betaine surfactant;

(b) approximately 0.05% to 25.0% by weight of a polyethylene glycol of molecular weight less than 5,000;

(c) approximately 0.05% to 25.0% by weight of a solvent having the general structure



wherein x_1 is 0 to 6, and x is 1 to 6;

(d) approximately 0.05% to 25.0% by weight of sodium salts of ethyelen diamine tetraacetic acid; and

(e) the remainder as water.

4,690,780

INSULATING MATERIAL AND USE THEREOF IN INSULATORS

Leonard V. Chabala, Maywood; John Haarsma, Barrington; Raymond P. O'Leary, Evanston; Christopher D. Roman, Glenview, and Thomas J. Tobin, Northbrook, all of Ill., assignors to S&C Electric Company, Chicago, Ill.

Division of Ser. No. 721,615, Apr. 10, 1985, Pat. No. 4,622,250. This application Jul. 1, 1986, Ser. No. 880,867
Int. Cl.[4] H01B *3/20*
U.S. Cl. 252—572 18 Claims

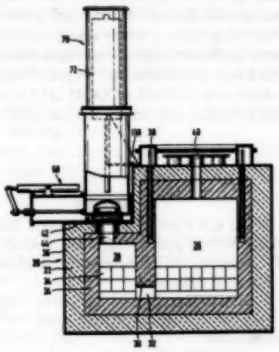
1. An insulating material consisting of 10% to 80% by volume of an insulating fluid and 20% to 90% by volume of solid insulative bodies, the relative volumes and densities of said insulating fluid and said solid bodies, and the shape of said solid bodies being determined to provide a relatively free-flowing mixture, the densities of said insulating fluid and said solid insulative bodies being generally equal, the apparent viscosity of the insulating material to an object moving therein being less than 20 times the viscosity of said insulating fluid.

4,690,781

METHOD OF FILLING A METAL VESSEL WITH A GLASS MELT CONTAINING HIGHLY RADIOACTIVE FISSION PRODUCTS

Wilfried Heimerl, Mol, and Eckhart Ewest, Balen, both of Belgium, assignors to Deutsche Gesellschaft für Widerauferbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 627,473, Jul. 3, 1984. This application Jul. 1, 1986, Ser. No. 881,008
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1983, 3324696
Int. Cl.[4] G21F *9/16, 9/34;* C03B *7/18*
U.S. Cl. 252—633 3 Claims



1. Method of filling a metal vessel with a radioactive glass melt from a glass-melt furnace disposed in a cell of a nuclear facility and having a closable suction port that communicates with a chamber of the furnace containing the radioactive glass melt, the vessel being provided with a suction tube mounted on the base wall thereof so as to communicate with the interior of the vessel and being sealed with a solid fused mass, the method comprising the steps of:

placing the metal vessel with the sealed suction tube extending therefrom into a holding device surrounding the vessel, the metal vessel being evacuated so that a partial vacuum is present therein;

positioning the holding device over the closable suction port of the glass-melt furnace so as to align the suction tube with respect thereto and so as to cause the holding device to hermetically seal off the suction port with respect to the atmosphere in the cell;

opening the suction port thereby causing said chamber to communicate with the interior of said holding device;

lowering the metal vessel until the suction tube dips into the glass melt in said chamber thereby causing said solid fused mass to melt whereby the glass melt flows upwardly into the metal vessel;

freezing the glass melt in the suction tube thereby again sealing the same with a solid fused mass;

moving the metal vessel upwardly until the suction tube is withdrawn from said furnace;

closing the suction port and positioning a sealing cover for the vessel directly beneath the metal vessel so that the inner surface of said cover faces upwardly; and,

again lowering the metal vessel to cause the suction tube to come into contact engagement with said inner surface thereby pushing the suction tube into the vessel as the same is lowered further and finally seating said cover in said vessel.

4,690,782

PROCESS FOR DECONTAMINATING MATERIALS CONTAMINATED BY RADIOACTIVITY

Godfried Lemmens, Leopoldslei 50, 2130 Brasschaat, Belgium

Filed Apr. 3, 1986, Ser. No. 847,776

Claims priority, application Belgium, Jan. 30, 1986, 2/60917

Int. Cl.[4] G21F *9/00*; C23G *1/02*

U.S. Cl. 252—626 **14 Claims**

1. A process for decontaminating radioactively contaminated material comprising the steps of:

(a) successively bringing into contact for a predetermined length of time the surface of the contaminated material with a solution of sodium carbonate,

(b) bringing the surface of the contaminated material into contact with heated and diluted nitric acid, thereafter potassium permanganate is added thereto,

(c) bringing the surface of the contaminated material into contact for a predetermined length of time with a solution of oxalic acid (COOH—COOH.$2H_2O$), and

(d) finally rinsing and drying the material.

4,690,783

METHOD OF PREPARING ROSIN ESTER FROM POLYOL WITH PHOSPHOROUS ACID CATALYST

Robert W. Johnson, Jr., Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Aug. 29, 1986, Ser. No. 902,464

Int. Cl.[4] C08F *1/04*

U.S. Cl. 260—104 **12 Claims**

1. A method of preparing a polyol ester of rosin, which comprises esterifying a rosin with a polyol in the presence of a catalytically effective amount of phosphorous acid.

4,690,784

PROCESS FOR PREPARING PHOSPHATIDYLCHOLINE DERIVATIVES

Yukihiro Nanba, and Toshiyuki Sakakibara, both of Kobe, Japan, assignors to Nippon Fine Chemical Co., Ltd., Osaka, Japan

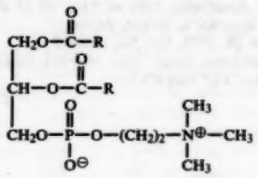
Filed May 28, 1985, Ser. No. 738,220

Claims priority, application Japan, May 30, 1984, 59-110450

Int. Cl.[4] C07F *9/10*

U.S. Cl. 260—403 **15 Claims**

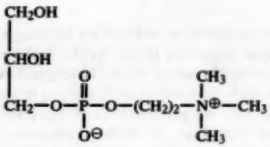
1. A process for preparing a phosphatidylcholine derivative represented by the formula



(I)

wherein R represents straight- or branched-chain and saturated or unsaturated hydrocarbon group, the process consisting essentially of the steps of:

(i) providing a suspension or solution of (a) glycerophosphatidylcholine represented by the formula



(II)

and (b) a carrier selected from the group consisting of a porous mineral material and an inorganic neutral salt in a solvent and removing the solvent from the suspension or solution by distillation to obtain a powder, and

(ii) reacting the glycerophosphatidylcholine of the formula (II) present in the powder with an acid anhydride represented by the formula:

$$(RCO)_2O \qquad \text{(III)}$$

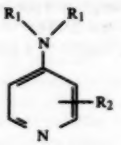
wherein R is as defined above or an acid halide represented by the formula

$$RCOX \qquad \text{(IV)}$$

wherein R is as defined above and X represents halogen atom, in a solvent and in the presence of a basic catalyst, to acylate the glycerophosphatidylcholine of the formula (II)

wherein the carrier is used in an amount of about 1 to about 100 parts by weight per part by weight of the gylcerophosphatidylcholine of the formula (II) and

wherein the basic catalyst is tri(C_1–C_4alkyl)amine or a pyridine derivative represented by the formula



(V)

wherein R_1 represents straight- or branched-chain alkyl group having 1 to 4 carbon atoms or two R_1 groups, when taken together with the nitrogen to which they are attached, form a pyrrolidino group, and R_2 represents an alkyl group having 1 to 4 carbon atoms or an hydrogen atom.

4,690,785

LOW WATER NEUTRALIZATION TO PRODUCE A HIGHLY ACTIVE ALKARYL SULFONATE

Marvin L. Mausner, Teaneck, N.J., and Siegfried Meinstein, Oaklawn, Ill., assignors to Witco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 747,546, Jun. 21, 1985, abandoned, which is a continuation-in-part of Ser. No. 258,202, Apr. 27, 1981, abandoned. This application Jul. 7, 1986, Ser. No. 882,290

Int. Cl.[4] C07C *143/24*

U.S. Cl. 260—505 N 14 Claims

1. A low water concentration, essentially one-step process for the preparation of an alkaryl sulfonate in the form of a dry, free flowing powder, comprising: forming a reaction mixture consisting essentially of an alkaryl sulfonic acid and a salt-forming base, the concentration of the salt-forming base in the mixture being such that the total concentration of the water in the reaction mixture which may be present in the salt-forming base and/or formed during the neutralization reaction between the alkaryl sulfonic acid and the salt-forming base will be below about 15%, by weight; and utilizing substantially only the heat generated during the neutralization reaction to remove the said water present in the salt-forming base and/or formed during said neutralization reaction from the mixture to provide a dry, free-flowing powder having an alkaryl sulfonate concentration of about 90%, by weight.

4,690,786

PROCESS FOR PRODUCING A MICROCAPSULE CONTAINING A LIQUID ACTIVE MATERIAL

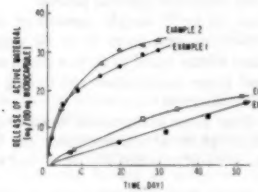
Yasuo Ninomiya; Chiaki Komamura, and Yoshikazu Musa, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 608,834, May 10, 1984, abandoned. This application Feb. 24, 1986, Ser. No. 832,602

Claims priority, application Japan, Dec. 12, 1983, 58-234688

Int. Cl.[4] A61K *9/52*; B01J *13/02*

U.S. Cl. 264—4.6 16 Claims



1. A process for producing a microcapsule containing a liquid active material, which can release the liquid material into an ambient atmosphere (30°±15° C.) at a controlled rate, comprising the steps of:

(1) dissolving in an organic solvent a polysulfone and an active material which has a limited solubility of about 0.01 to about 2 parts by weight in 100 parts by weight of said polysulfone and which is liquid at room temperature, the amount of said liquid active material added being more than the limited solubility and being about 2 to about 250 parts by weight per 100 parts by weight of the polysulfone and said organic solvent being capable of dissolving the respective components and being more volatile than said active material;

(2) atomizing the resulting solution through a nozzle into a gaseous atmosphere to form a mist of tiny liquid droplets; and

(3) removing the solvent from the droplets by evaporation so as to provide a microcapsule having the liquid active material confined by the wall of said microcapsule made of the polysulfone.

4,690,787

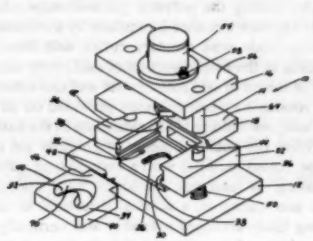
APPARATUS AND METHOD FOR MAKING POSITIONERS

Jeffery L. Fasnacht, 4956 Douglas Ave., Racine, Wis. 53402

Filed May 9, 1986, Ser. No. 861,441

Int. Cl.[4] B29C *43/04*, *43/52*

U.S. Cl. 264—16 18 Claims



1. In apparatus for forming tooth positioners of the type including a pair of aligned opposed toothwork model mounting means relatively movable toward each other and a holding member between the mounting means having a cavity to receive a positioner blank, the improvement comprising:

heating means embedded in the holding member; and

means to apply pressure on upper and lower surfaces of a blank in the cavity through the mounting means and the toothwork models thereon to shape the blank on the upper and lower surfaces,

whereby heat can be specifically applied to the blank.

17. A method for forming tooth positioners comprising:

mounting a pair of upper and lower toothwork models on aligned opposed toothwork model mounting means;

loading a positioner blank into a blank-receiving cavity of a holding member;

placing the loaded holding member between the upper and lower toothwork models with the blank in alignment with the models;

heating the loaded holding member by applying heat internally to the holding member; and

applying pressure simultaneously to upper and lower surfaces of the blank through the toothwork models.

4,690,788

PROCESS FOR PREPARING WATER-SOLUBLE POLYMER GEL PARTICLES

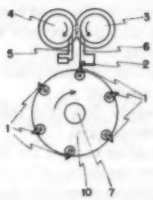
Akira Yada; Shusaku Matsumoto, both of Kyoto; Yoshihiro Kawamori, Joyo; Takao Saito, Nagaokakyo; Tadashi Nishiyama, and Yoshitugu Adachi, both of Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Nov. 5, 1985, Ser. No. 795,263

Claims priority, application Japan, Nov. 6, 1984, 59-233560; Nov. 6, 1984, 59-233561; Nov. 13, 1984, 59-239229

Int. Cl.[4] B02C *4/08*; B29B *9/02*; B29C *33/06*, *35/08*

U.S. Cl. 264—22 19 Claims



1. A process for preparing dry, spherical, polymer gel, powder particles from an aqueous polymer gel in a wet state ob-

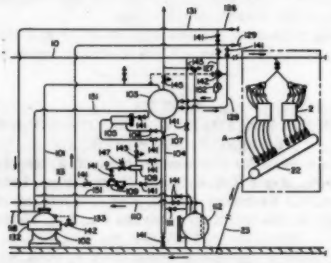
tained by subjecting an aqueous solution of a water-soluble vinyl monomer to polymerization which comprises feeding said polymer gel in a wet state into a roller cutter including a pair of cutter rollers wherein the rollers bite into said polymer gel with a plurality of annular projections or grooves at predetermined intervals on surfaces of the rollers, said rollers rotating in the opposite directions to each other to engage with each other, thereby cutting the polymer gel into strips; thereafter cutting said strips in a wet state into pieces by a combination of a fixed cutting blade with a rotary cutter, said fixed cutting blade extending in the axial direction of said roller cutter over at least the full length of said roller cutter and said rotary cutter including a rotatable cylindrical body provided on its periphery with at least one cutting blade extending in the axial direction; pulverizing the obtained pieces of polymer gel in a wet state into fine, round particles with a vertical type cutter comprising a casing, at least one vertically fixed cutting blade arranged in said casing in a vertical direction, at least one rotary cutting blade arranged rotatably and vertically in said casing and positioned to minimize the clearance between an edge of the rotary cutting blade and an edge of the fixed cutting blade, said vertical type cutter having a residence space wherein the polymer gel pieces to be pulverized are located, and the residence time of the polymer gel pieces in said residence space being at least 3 minutes; and drying said fine, round particles.

4,690,789

REFRIGERANT COOLED PLASTIC MOLDING, METHOD AND APPARATUS

Robert C. Ritchie, Braintree, Mass.; Henry J. McKone, Francestown, N.H., and Richard H. Stamm, Mt. Prospect, Ill., assignors to Dart Industries Inc., Northbrook, Ill. and Energy Systems Industries, Inc., Newton, Mass.

Filed Mar. 13, 1985, Ser. No. 711,546
Int. Cl.[4] B29C *35/04, 45/72, 45/76*
U.S. Cl. 264—40.1 **26 Claims**



1. A method for molding hardenable material in a mold a molding machine subject to repeated and rapid variations in mold cooling requirements, the mold being of the type having one or more cooling fluid passageways formed therethrough, said method comprising the steps of:

providing a supply flow of liquid phase refrigerant to the site of the molding machine;

distributing the supply flow into feed flows through the cooling fluid passageways;

independently adjusting each of the feed flows to obtain a mixed phase flow consisting of a boiling liquid phase and vapor phase refrigerant mixture throughout each of the cooling fluid passageways; and

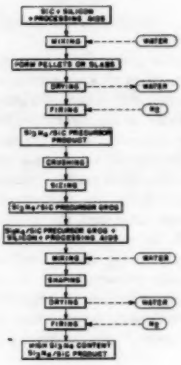
monitoring each feed flow exiting each passageway such that a majority of such flow by weight is in a liquid phase.

4,690,790

SILICON NITRIDE/SILICON CARBIDE COMPOSITION AND ARTICLES THEREOF

Carl H. Bates, South Amboy, N.J., assignor to Stemcor Corporation, Cleveland, Ohio

Filed Jul. 23, 1985, Ser. No. 758,184
Int. Cl.[4] C04B *35/56, 35/58*
U.S. Cl. 264—63 **8 Claims**



1. A process for the preparation of an article of silicon nitride - bonded silicon carbide comprising:

a. forming an admixture of finely divided silicon metal, and SiC grain, shaping said admixture into discrete pellets, drying said pellets, firing said dried pellets in a nitrogenous non-oxidative atmosphere at a temperature and for a period sufficient to convert substantially all of said silicon metal to Si_3N_4, thereby resulting in formation of Si_3N_4-bonded SiC precursor material pellets having a Si_3N_4 content of at least 50 weight percent;

b. crushing said precursor material pellets;

c. mixing from 30 to 75 weight percent of said crushed precursor material with from 16 to 60 weight percent finely divided silicon metal to form a green composition;

d. shaping said green composition and drying said shaped green composition; and

e. firing said dried green composition in a nitrogenous non-oxidative atmosphere at a temperature and for a period sufficient to convert substantially all of said silicon metal to Si_3N_4.

4,690,791

PROCESS FOR FORMING CERAMIC PARTS

Charles G. Edmiston, San Ramon, Calif., assignor to GTE Products Corporation, Stamford, Conn.

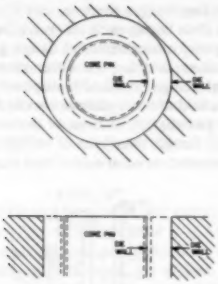
Filed Oct. 2, 1985, Ser. No. 782,822
Int. Cl.[4] B29C *59/00*
U.S. Cl. 264—122 **5 Claims**

1. A process comprising:

(a) filling a die cavity of sufficient dimensions to produce parts having an aspect ratio of greater than 4:1 with a powder having widely varying realtive sizes of generally spherical shapes.

(b) providing an acoustical energy of a frequency of from about 2 to about 200 kilohertz to at least a portion of said

cavity to thereby cause an induced motion to said powder during the filling of said die cavity and



(c) compressing said powder under pressure to form a compressed part having said aspect ratio.

4,690,792

BIAXIALLY DRAWN LAMINATED FILMS PREPARED BY SEQUENTIAL STRETCHING

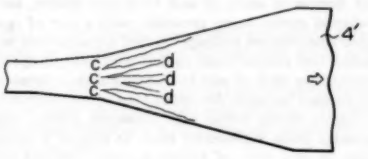
Hitoshi Matsuda, Tsuchiura; Tsuguo Okumura, Ibaraki, and Kazuharu Abe, Tsuchiura, all of Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed May 9, 1986, Ser. No. 861,571

Claims priority, application Japan, May 10, 1985, 60-99334

Int. Cl.⁴ B29C *55/14, 55/26*

U.S. Cl. 264—235.8 **8 Claims**



1. A process for the preparation of biaxially drawn laminated films, which comprises:

a first step of forming a substantially amorphous unoriented laminated film comprising a saponified ethylene/vinyl acetate copolymer having an ethylene content of 25 to 45% by mole and a saponification degree of at least 98% and a polyamide, and drawing the film in the longitudinal direction at a deformation rate of at least 10,000%/min and a draw ratio of 2.7 to 3.5 at a temperature adjusted to 45° to 65° C. by using a roll type longitudinal drawing machine;

a second step of transferring the film drawn in the longitudinal direction at the first step to the transverse drawing-initiating point of a tenter type transverse drawing machine, expanding the width of the film at an angle of not larger than 6° with respect to the central line of the width of the film at least until the mechanically set ratio of the tenter clip distance to the original distance becomes at least 1.4 while maintaining the temperature of the tenter clips at a level lower than the temperature of the film and drawing the film in the traverse direction at an average deformation rate of 2,000 to 10,000%/min and a draw ratio of 3 to 5 under temperature conditions such that, from the transverse drawing-initiating point, the temperature of the film is elevated stepwise so that the temperature of the film is in the range of 70° to 100° C. at the point of termination of the transverse drawing; and

a third step of heat-treating the film drawn in the transverse direction at the second step at a temperature ranging from 110° C. to the temperature lower by 10° C. than the melting point of the starting polyamide.

7. A process for preparation of biaxially drawn laminated films according to claim 1, wherein the substantially amorphous unoriented laminated film formed at the first step comprises an intermediate layer of the saponified ethylene/vinyl acetate copolymer having an ethylene content of 25 to 45% by mole and a saponification degree of at least 98% and layers of the polyamide laminated on both the surfaces of the intermediate layer, respectively.

8. A process for the preparation of biaxially drawn laminated films according to claim 1, wherein the substantially amorphous unoriented laminated film formed at the first step comprises an intermediate layer of the polyamide and layers of the saponified ethylene/vinyl acetate copolymer having an ethylene content of 25 to 45% by mole and a saponification degree of at least 98%, which are laminated on both the surfaces of the intermediate layer, respectively.

4,690,793

NUCLEAR FUSION REACTOR

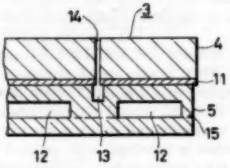
Hitachi, Ltd., Tokyo, Japan; Hisanori Okamura, Toukai; Kunio Miyazaki, Hitachi; Hirosi Akiyama, Hitachi; Shinichi Itoh, Hitachi; Tomio Yasuda, Hitachi; Kousuke Nakamura, Hitachi; Yukio Okoshi, Mito; Mutuo Kamoshita, Katsuta, and Akio Chiba, Hitachi, all of Japan

Filed Feb. 17, 1984, Ser. No. 581,076

Claims priority, application Japan, Feb. 18, 1983, 58-24633

Int. Cl.⁴ G21B *1/00;* **B32B** *15/04, 15/20*

U.S. Cl. 376—136 **17 Claims**



1. A nuclear fusion reactor which comprises a vacuum vessel for enclosing plasma particles; coils distributed around the vacuum vessel for generating a magnetic field; and a reactor wall that is exposed to the plasma particles within said vacuum vessel; the reactor wall having a piled structure in which many separate heat-resisting ceramic tiles are bonded to a metal-base body operatively associated with cooling means, gaps being formed between neighboring ceramic tiles and said metal-base body having grooves formed at portions corresponding to at least some of the gaps; said ceramic tiles being formed of compounds of elements having atomic numbers less than 14 and being bonded by a brazing material forming a junction layer between the tiles and the metal-base body.

4,690,794

SYSTEM FOR CONTROLLING DRIVING WATER FOR CONTROL ROD DRIVING MECHANISM OF NUCLEAR REACTOR

Katsushige Onodera, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 580,570

Claims priority, application Japan, Feb. 17, 1983, 58-26053

Int. Cl.⁴ G21C *7/16*

U.S. Cl. 376—230 **27 Claims**

1. In a boiling water reactor having a plurality of control rods in the reactor and adapted to be driven independently by corresponding control rod driving mechanisms having a hydraulic piston adapted to be actuated by pressurized water supplied thereto through a hydraulic unit annexed to each

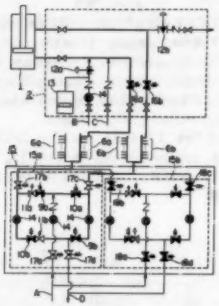
control rod driving mechanism to drive the associated control rod into and out of the reactor core, a system for controlling the driving water for the control rod driving mechanism characterized in that a control rod driving water control unit, which controls the direction of movement of said hydraulic pistons, is used commonly for one or a plurality of independently selectable control rod driving mechanisms, said control rod driving water control unit including:

first conduit means for providing passage for water between said control rod driving water control unit and said hydraulic unit;

second conduit means for providing passage for the water between said control rod driving water control unit and said hydraulic unit;

system means for supplying the water, including first valve means for coupling said supplying system means to a selected one of said first and second conduit means; and

system means for draining the water, including second valve means operable in conjuction with said first valve means



for coupling said draining system means to the other one of said first and second conduit means; and

that said hydraulic unit annexed to each control rod driving mechanism is provided with control rod selector valves which are adapted to be selectively actuated in conjuction with operation of said control rod driving water control unit to connect both inlet and outlet of each of said control rod driving mechanisms selectively to said control rod driving water control unit via not more than two conduits extending between each control rod driving mechanism and said first and second conduit means; said two conduits including:

third conduit means connectable by said selector valves to the discharge side of said first valve means, for supplying the water for driving the hydraulic piston in a first direction;

fourth conduit means connectable by said selector valves to the suction side of said second valve means, for supplying the water for driving the hydraulic piston in a second direction.

4,690,795

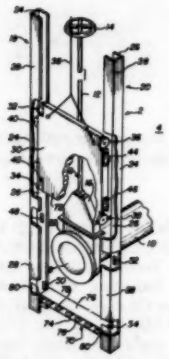
EMERGENCY TRANSFER TUBE CLOSURE AND PROCESS FOR SEALING TRANSFER TUBE UNDER EMERGENCY CONDITIONS

Roy T. Hardin, Jr., Unity Township, Westmoreland County, and James R. Marshall, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1985, Ser. No. 785,293
Int. Cl.[4] G21C *19/19*
U.S. Cl. 376—264 **12 Claims**

1. In a nuclear fuel reactor well that includes a transfer tube projecting outwardly from wall thereof, said transfer tube having a first closure assembly, and said transfer tube having a circumferential flange extending outwardly laterally therefrom, an emergency transfer tube closure therefor comprising;

a pair of elongated, vertically-extending U-shaped guides, one U-shaped guide disposed laterally on each side of said transfer tube, each of said U-shaped guides comprising a base and laterally-extending flanges thereon, said U-shaped guides having their open ends facing each other, a closure plate, having a surface facing said circumferential flange greater in area than the area circumscribed by the outer circumference of said circumferential flange, vertically disposed between said U-shaped guides, said closure plate normally being disposed in a vertical plane just slightly in front of the vertical plane of said circumferential flange, two pairs of rollers, one pair of which is rotatably mounted on each side of said closure plate adjacent



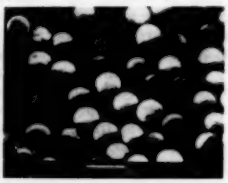
said U-shaped guides, riding on the inner portion of each of said flanges of each of said U-shaped guides, each of said U-shaped guides being provided with a pair of spatially disposed openings on a flange thereof adjacent said wall of said nuclear fuel reactor well, each of said pairs of openings being disposed on each of said U-shaped guides a distance equal to the distance between the center lines of the corresponding pair of rollers riding within said U-shaped guides, each of said openings being sufficiently large to receive a corresponding roller of said pairs of rollers in said U-shaped guides, said openings being shaped on said flanges of said U-shaped guides so that when said pairs of rollers are disposed therein, the face of said closure plate will be in sealing engagement with said circumferential flange of said transfer tube.

4,690,796

PROCESS FOR PRODUCING ALUMINUM-TITANIUM DIBORIDE COMPOSITES

Muktesh Paliwal, Sayre, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 13, 1986, Ser. No. 839,313
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—12 **8 Claims**



1. A process for producing composite powder particles consisting essentially of a matrix phase and a reinforcement phase, said process comprising:

(a) entraining agglomerated particles in a carrier gas, said

agglomerated particles consisting essentially particles of titanium diboride and particles of a metal selected from the group consisting of aluminum and aluminum based alloys;

(b) feeding said agglomerated particles through a high temperature zone having a temperature sufficient to allow said metal particles to melt, coalesce together, and encapsulate said titanium diboride particles; and

(c) resolidifying said metal to form said composite powder particles wherein said matrix phase consists essentially of said metal and said reinforcement phase consists essentially of said titanium diboride particles.

4,690,797

METHOD FOR THE MANUFACTURE OF LARGE AREA SILICON CRYSTAL BODIES FOR SOLAR CELLS

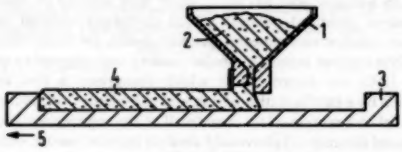
Achim Eyer, Freiburg/Breisgau; Armin Raeuber, Gundelfingen, and Norbert Schillinger, Ihringen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 17, 1986, Ser. No. 908,165

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536743

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—23 **10 Claims**



1. A method for the manufacture of large area silicon crystal bodies suitable for the manufacture of solar cells which comprises:

(a) compressing finely divided silicon powder particles into a layer of larger thickness than said particles, the compressing taking place in a form composed of silicon or a silicon compound,

(b) sintering the compressed layer into a self-supporting silicon foil at a first elevated temperature,

(c) irradiating the sintered silicon foil with a single-sided energy irradiation in a radiation zone to melt the foil up to at least one-half its thickness at a second elevated temperature,

(d) recrystallizing the melted portion of said foil,

(e) melting the remaining previously unmelted layer portion at a third elevated temperature, and

(f) recrystallizing the newly melted layer portion, the conditions being such that the recrystallized grains produced after treatment at said second elevated temperature continue to grow over the entire layer thickness of the silicon body.

4,690,798

ULTRASOFT STAINLESS STEEL

Tetsu Narutani, and Shigeharu Suzuki, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Feb. 18, 1986, Ser. No. 830,696

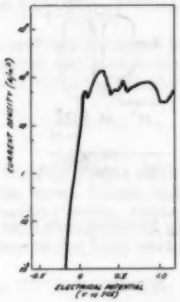
Claims priority, application Japan, Feb. 19, 1985, 60-31020; Apr. 12, 1985, 60-77876

Int. Cl.[4] C22C *38/20*

U.S. Cl. 420—61 **16 Claims**

1. An ultrasoft ferritic stainless steel having excellent stamping formability and corrosion resistance in use, which consists essentially of:

about 0.002 to 0.03% by weight of carbon, about 0.01 to 0.30% by weight of silicon, about 0.01 to 1.5% by weight of manganese, about 0.003 to 0.04% by weight of phosphorus, about 0.001 to 0.15% by weight of sulfur, about 0.02 to 1.0% by weight of nickel, about 0.005 to 0.50% by weight of copper, about 0.01 to 0.6% by weight of molybdenum, about 11.5% to 20% by weight of chromium,



about 0.005 to 0.03% by weight of nitrogen, about 0.005% to 0.20% by weight of aluminum, and the balance consisting of iron and conventional impurities, said ultrasoft steel having a Vickers hardness equal to about 140 or less.

4,690,799

SUPERELASTIC DENTAL AU-CU-ZN ALLOYS

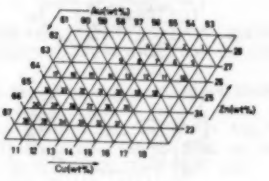
Takaichi Yoshida, Musashino, Japan, assignor to G-C Dental Industrial Corp., Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 838,949

Claims priority, application Japan, Apr. 2, 1985, 60-68531

Int. Cl.[4] C22C *5/02*

U.S. Cl. 420—507 **3 Claims**



1. A superelastic dental Au-Cu-Zn alloy having enhanced corrosion resistance selected from the group of alloys whose compositions are defined by the zone encompassed by the region of points 2-9-16-24-30-35-34-19-11-2 of FIG. 2.

4,690,800

PROCESS FOR REDUCING THE CHANCES OF IGNITION AND EXPLOSION DUE TO THE DECOMPOSITION OF HIGH-PRESSURE INDUSTRIAL PROCESS GASES

Alain Nardi, Bolbec, and Jean-Nöel Simier, Lillebonne, both of France, assignors to Societe Chimique des Charbonnages-CdF chimie, Paris, France

Division of Ser. No. 143,636, Apr. 25, 1980, Pat. No. 4,622,059. This application Aug. 27, 1986, Ser. No. 901,049

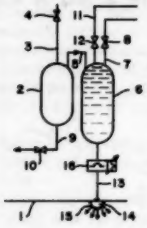
Claims priority, application France, Apr. 25, 1979, 79 10444

Int. Cl.[4] G05B *9/00*

U.S. Cl. 422—40 **11 Claims**

1. A process for reducing the danger of ignition and explo-

sion due to the decomposition of ethylene gases in a high-pressure vessel, comprising cooling the decomposition gases with a



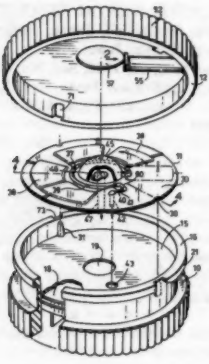
delay not exceeding 25 milliseconds from the time the gases begin to flow out of the vessel into an evacuation circuit.

4,690,801

DEVICE FOR PERFORMING ENZYME IMMUNOASSAYS

Hugh B. Anderson, Toronto, Canada, assignor to Allelix Inc., Mississauga, Canada

Filed Jun. 3, 1986, Ser. No. 870,320
Int. Cl.[4] G01N *33/52, 37/00, 21/05*
U.S. Cl. 422—68 **18 Claims**



1. A device for performing chemical and immunochemical assays, comprising:

a disk having a thin flexible membrane applied to one side thereof, the membrane coacting with the disk to form a circumferentially disposed conduit having entrance and exit ends and also a plurality of circumferentially disposed reagent reservoirs, the reservoirs being isolated from one another or from the conduit by frangible seals, the frangible seals being arranged to define the desired flow of reagents through the conduit;

at least one assay tube having entrance and exit ends, the entrance end being attached to the exit end of the conduit, the assay tube having an assay reagent bonded to the inner wall thereof;

test sample injection means for flowing test sample through the assay tube; and

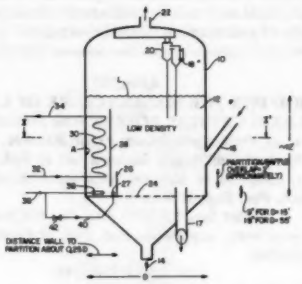
means for forcing the contents of each reservoir through the conduit and the assay tube in the desired order by causing the rupture of each frangible seal sequentially, said means preventing back flow of reagent in the conduit.

4,690,802

APPARATUS FOR CONTROLLING THE TEMPERATURE IN CATALYST REGENERATION

Ronald J. Jenkinson, Madison, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 31, 1985, Ser. No. 815,211
Int. Cl.[4] B01J *8/26*
U.S. Cl. 422—141 **3 Claims**



1. In a regenerator having an inner wall adapted to contain a bed of fluidized catalyst which comprises catalyst inlet means, catalyst outlet means, gas inlet means, gas outlet means, catalyst support means, a tubular cooling coil adapted to contain H_2O, the improvement which comprises: a first zone formed by a partition disposed in said regenerator substantially parallel to a section of the inner wall of the regenerator and at a spaced distance (a) above said catalyst support means, and (b) from said inner regenerator wall, said tubular coil being vertically disposed in the space between said partition and the inner wall of said regenerator, a baffle connected to said catalyst support means and projecting vertically upwardly, said baffle being at a spaced distance from said partition, said catalyst support means being imperforated from below said baffle to under said first zone formed by said partition and said inner wall of said regenerator wherein said coil is vertically disposed, and said catalyst support means having orifices below a second zone formed by said baffle and said inner wall of the regenerator on a side of said baffle opposite said first zone, means for introducing a first fluidizing gas into said first zone, means for introducing a second fluidizing gas into the space between said baffle and said partition, and control means disposed in said means for introducing said second fluidizing gas between said baffle and said partition to control the introduction of said fluidizing gas into said space in said regenerator.

4,690,803

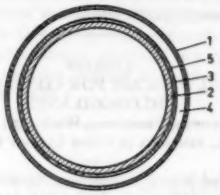
OZONE GENERATOR

Michael Hirth, Unterentfelden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Apr. 14, 1986, Ser. No. 851,160
Claims priority, application Switzerland, May 21, 1985, 2154/85
Int. Cl.[4] B01J *19/08, 19/12*
U.S. Cl. 422—186.18 **6 Claims**

1. In an ozone generator with a first and a second metallic electrode and a layer of a dielectric material of titanium dioxide ceramic or of plastic filled with a dielectric power on that surface of the second electrode which faces the first electrode,

and a discharge gap between the first electrode and the dielectric layer, the improvement comprising that the surface facing



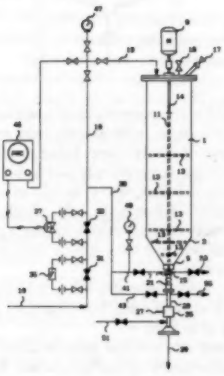
the discharge gap of the dielectric layer is coated with a protective glass or ceramic layer based on silica (SiO_2).

4,690,804

CATALYST FEED SYSTEM

Raymond G. Rohlfing, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 514,387, Jul. 15, 1983, Pat. No. 4,563,665, which is a continuation of Ser. No. 282,312, Jul. 10, 1981, abandoned. This application Sep. 18, 1985, Ser. No. 777,145
Int. Cl.[4] B01J *8/08*
U.S. Cl. 422—219 **4 Claims**



1. An apparatus for charging polymer-coated catalyst compositions to a reactor comprising:

(a) a catalyst mixing tank comprising:

(i) a vertically aligned, elongated vessel having a bottom portion with an axially aligned port at the vessel bottom portion with an axially aligned, cylindrical outlet conduit attached to said port, and

(ii) a agitator shaft axially aligned within said vessel, said shaft terminating in a spiral configuration, said spiral configuration extending through the port in the vessel bottom portion and at least a portion of said outlet conduit and terminating within said outlet conduit, said spiral configuration sized to move freely within said outlet conduit thereby providing agitation of material therein, and

(b) a ball-check feed valve attached to a conduit extending from said outlet conduit of said mixing tank, said ball-check feed valve having a symmetrical clearance between ball and cylinder in a range of about 0.040 inch to about 0.100 inch.

4,690,805

PROCESS FOR REMOVAL OF MERCAPTANS FROM GAS STREAMS

Kishan Bhatia, Katy, and John G. Garcia, Jr., Houston, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 11, 1986, Ser. No. 838,379
Int. Cl.[4] C01B *17/16, 31/20*
U.S. Cl. 423—224 **13 Claims**

1. A process for removing mercaptins from a gaseous mixture comprising treating said gaseous mixture with an inorganic, water soluble nitrite and an effective amount of a water soluble polysulfide.

4,690,806

REMOVAL OF SULFUR FROM PROCESS STREAMS

James J. Schorfheide, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 1, 1986, Ser. No. 858,036
Int. Cl.[4] C01B *17/10, 31/20, 17/00*; B01J *8/00*
U.S. Cl. 423—230 **18 Claims**

1. In a process for the removal of sulfur compounds from a process stream in which a metal alumina spinel sorbent is used, which sorbent is characterized by the formula:

$$MAl_2O_4$$

wherein M is a divalent cation selected from the group consisting of chromium, iron, cobalt, nickel, copper, cadmium, mercury, magnesium, and zinc, the improvement which comprises: significantly increasing the absorbent capacity of the alumina spinel for said sulfur compounds by:

(a) providing that M is one or more of the above mentioned divalent cations; and

(b) substituting at least 5 mole %, but not as much as 100 mole %, of the aluminum with one or more trivalent cations selected from the group consisting of chronium, molybdenum, tungsten, manganese, iron, cobalt, and nickel.

4,690,807

PROCESS FOR THE SIMULTANEOUS ABSORPTION OF SULFUR OXIDES AND PRODUCTION OF AMMONIUM SULFATE

Abdus Saleem, Leola, Pa., assignor to General Electric Environmental Services, Inc., Lebanon, Pa.

Continuation-in-part of Ser. No. 765,774, Aug. 15, 1985, abandoned. This application Feb. 20, 1986, Ser. No. 831,381
Int. Cl.[4] C01B *17/00*; C01C *1/24*
U.S. Cl. 423—242 **26 Claims**

1. A multi-step process for treating a gas containing a sulfur oxide in a single vessel comprising:

(a) passing the gas containing sulfur oxide through a spray of aqueous ammonium sulfate in the vessel to form an aqueous ammonium sulfate having sulfur oxide absorbed therein and a scrubbed gas;

(b) collecting in a reservoir in the vessel the aqueous ammonium sulfate having sulfur oxide gas absorbed therein;

(c) introducing aqueous ammonia into the aqueous ammonium sulfate having sulfur oxide gas absorbed therein;

(d) introducing an oxygen-containing gas into the aqueous ammonium sulfate having sulfur dioxide absorbed therein in the reservoir whereby ammonium sulfate product is formed in the reservoir by the reaction of the absorbed sulfur oxide gas with the ammonia in the aqueous ammonia and the oxygen in the oxygen-containing gas;

(e) forming the spray of aqueous ammonium sulfate through which the gas containing sulfur oxide is passed, from aqueous ammonium sulfate liquor removed from the reservoir;

(f) withdrawing scrubbed gas; and

(g) withdrawing ammonium sulfate product.

4,690,808

CRYSTALLINE GALLOPHOSPHATE COMPOSITIONS

Stephen T. Wilson, Shrub Oak; Naomi A. Woodard, Peekskill, and Edith M. Flanigen, White Plains, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 20, 1985, Ser. No. 811,282
Int. Cl.[4] C01B *25/00*; B01J *27/14*
U.S. Cl. 423—305 26 Claims

1. Crystalline gallophosphate compositions having a framework structure whose chemical composition expressed in terms of mole ratios of oxides is

$$mR:Ga_2O_3:1.0\pm0.2P_2O_5;$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" has a value of from 0.02 to 0.3 and represents the moles of "R"; said framework structure being microporous in which the pores have nominal diameters within the range of about 3 to about 10 Angstroms.

2. Crystalline gallophosphate compositions having a framework structure whose chemical composition expressed in terms of mole ratios of oxides is

$$Ga_2O_3:1.0\pm0.2P_2O_5;$$

said framework structure being microporous in which the pores have nominal diameters within the range of about 3 to about 10 Angstroms; and said framework structure retains at least 50 percent of its crystallinity upon calcination at a temperature of at least 300° C. for at least one hour.

5. Process for preparing a microporous crystalline gallophosphate according to claim 1 or 2 which comprises forming a reaction mixture having a composition expressed in terms of mole ratios of oxides of

$$Ga_2O_3:1.0\pm0.5P_2O_5:7\text{-}100H_2O$$

and containing from about 0.2 to 10.0 moles of an organic templating agent per mole of Ga_2O_3, and heating said reaction mixture at a temperature of at least 100° C. until crystals of said gallophosphate are produced.

4,690,809

PROCESS FOR THE PREPARATION OF ASBESTIFORM CRYSTALLINE CALCIUM SODIUM METAPHOSPHATE FIBERS

Vaidy R. Nathan; John T. Wang, and James E. Downes, all of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 812,042, Dec. 23, 1985, abandoned. This application Nov. 5, 1986, Ser. No. 924,674
Int. Cl.[4] C01B *25/30*
U.S. Cl. 423—306 20 Claims

1. A process for the preparation of asbestiform crystalline calcium sodium metaphosphate fibers, which process comprises:

(a) heating substantially crystalline calcium sodium metaphosphate, or at least one compound convertible by heat thereto, having a composition on a dry basis equivalent to a $CaO/Na_2O/P_2O_5$ mol percent ratio of about 29.0–34.0/16.0–18.0/50.0–53.0 and a degree of crystallinity from about 60% to about 75% as determined from density and differential thermal analysis measurements in a melting zone at a temperature and for a time sufficient to form a homogeneous melt;

(b) cooling the homogeneous melt in a cooling zone to a temperature and at a rate sufficient to form a supercooled melt;

(c) introducing into the supercooled melt at least one seed crystal of asbestiform crystalline calcium sodium metaphosphate;

(d) maintaining the seeded supercooled melt under isothermal conditions at the seeding temperature for a time sufficient to form crystalline blocks of asbestiform calcium sodium metaphosphate; and

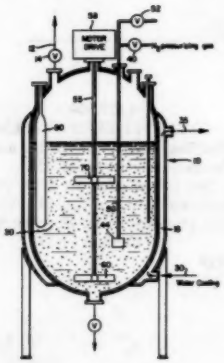
(e) fiberizing the crystalline blocks of asbestiform calcium sodium metaphosphate into fibers.

4,690,810

DISPOSAL PROCESS FOR CONTAMINATED CHLOROSILANES

William C. Breneman, Vancouver, Wash., and David M. Reeser, Tigard, Oreg., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 26, 1986, Ser. No. 844,362
Int. Cl.[4] C01B *33/12, 7/00*; C01F *55/26, 11/20*
U.S. Cl. 423—335 3 Claims



1. A method for the conversion of a stream of contaminated chlorosilanes to a stable, substantially inert and filterable solids mass, said stream of chlorosilanes being predominantly trichlorosilane and silicon tetrachloride and being contaminated by about 0.1 to about 5 percent by weight of impurities selected from the chlorides of aluminum, iron, titanium, and up to 20% by weight of finely divided metals having a particle size of less than 40 microns selected from silicon, iron and aluminum, said method comprising

(i) providing a bath of water-based lime particle slurry having a CaO to H_2O ratio, by weight, of about 0.05 to 0.20 and a pH of at least 9

(ii) introducing into the lime particle slurry bath at a location substantially below its surface, a said stream of contaminated chlorosilanes to cause reaction of the chlorosilanes and contaminants with CaO to result in (a) replacement of the solid particles of CaO in the bath with solid reaction product particles of SiO_2 in which oxides of other contaminants are entrapped and (b) an aqueous phase containing dissolved $CaCl_2$

(iii) monitoring the pH of the aqueous phase and recovering said solid reaction products particles from the bath when the pH is in the range of 7–8.

4,690,811

PROCESS FOR PREPARING SILICON CARBIDE WHISKERS

Tohru Kida, Chigasaki, and Motohiro Yamamoto, Fujisawa, both of Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1985, Ser. No. 798,787
Claims priority, application Japan, Nov. 21, 1984, 59-244554
Int. Cl.[4] C01B *31/36*
U.S. Cl. 423—345 6 Claims

1. A process for preparing silicon carbide whiskers, comprising blending a silicon source material with carbon black, as a

carbonaceous material, having (a) a nitrogen adsorption specific surface area of 150 to 500 m^2/g, (b) a dibutyl phthalate absorption of 120 to 200 ml/100 g, and a tint strength (%) smaller than or equal to a value calculated according to the following formula: 0.3496×(nitrogen adsorption specific surface area)−0.2143×(dibutyl phthalate absorption)+101.87; and heating the resulting mixture in a non-oxidizing atmosphere at 1,300° to 1,800° C.

4,690,812

INTEGRATED PRODUCTION OF AMMONIA AND UREA

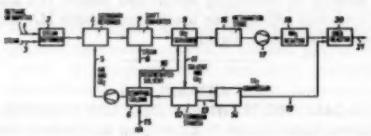
Gerhard Ranke, Poecking, and Ulrich Schrader, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,563

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401779

Int. Cl.⁴ C01C *1/04*

U.S. Cl. 423—359 **5 Claims**



1. In a process for the combined production of ammonia and urea, comprising the steps of reacting gas containing hydrocarbons with steam in a steam reformer, reacting residual hydrocarbon in a downstream secondary reformer with air, reacting resultant CO in a shift converter to form CO_2 and H_2, scrubbing resultant ammonia synthesis gas consisting essentially of hydrogen, nitrogen and carbon dioxide with a physical solvent to remove CO_2, regenerating resultant CO_2-loaded physical solvent to recover a CO_2 stream, passing said CO_2 stream to urea synthesis, and recycling resultant regenerated solvent to the scrubbing step, the improvement wherein said regenerating of said physical solvent comprises: (a) effecting at least one pressure reduction step on the CO_2-loaded physical solvent to liberate a gaseous stream containing a major portion of the CO_2 for urea synthesis and to obtain a physical solvent having residual CO_2, and (b) stripping the latter residual CO_2-containing physical solvent with air as the stripping gas; recovering a mixture of the air together with said residual CO_2 from the stripping step and feeding said mixture into the secondary reformer.

4,690,813

MOLYBDENUM OXIDE WHISKERS AND A METHOD OF PRODUCING THE SAME

Yoshimi Kamijyo, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 13, 1985, Ser. No. 775,659

Claims priority, application Japan, Sep. 14, 1984, 59-193751; Oct. 19, 1984, 59-220073; Oct. 19, 1984, 59-220074

Int. Cl.⁴ C01G *39/02*

U.S. Cl. 423—606 **3 Claims**

1. A method of producing whiskers of molybdenum oxide MoO_3 comprising:

firing metallic molybdenum in an open-ended vessel at a temperature of at least 400° C. in a flow of gas through the vessel containing oxygen;

recovering the resulting whiskers of molybdenum oxide from the gas exiting the end of the vessel;

heating molybdenum oxide remaining in the vessel to a temperature of 950° C. to 1100° C. in a hydrogen atmosphere to reduce it into metallic molybdenum; and

reusing the metallic molybdenum obtained by said reduction as a starting material.

4,690,814

PROCESS FOR THE PRODUCTION OF HYDROGEN

Louis J. Velenyi, Lyndhurst, and Andrew S. Krupa, Twinsburg, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 692,157, Jan. 17, 1985, abandoned. This application Apr. 9, 1986, Ser. No. 849,925

Int. Cl.⁴ C01B *31/18*

U.S. Cl. 423—648 R **17 Claims**

1. A process for the production of hydrogen which process comprises reacting steam with carbon in the presence of a catalyst system comprising a supported Group VIIIA metal and, as modifier for the suppression of methane, an effective amount of one or more of phosphomolybdic acid, phosphotungstic acid and/or a salt of either.

4,690,815

METHOD FOR TESTING SKIN FOR PRESENCE OF MOISTURIZER

George E. Deckner, Westfield, N.J., assignor to Charles of the Ritz Group Ltd., New York, N.Y.

Filed Aug. 15, 1985, Ser. No. 765,632

Int. Cl.⁴ C12Q *1/58*; G01N *33/62, 33/68, 33/48*

U.S. Cl. 424—9 **11 Claims**

1. A method for determining the presence of moisturizing substances on skin, which comprises providing a moisturizing composition which includes an active material capable of binding with water to form a complex, applying the moisturizing composition to desired areas of the skin to form a film or coating which includes such complex and which inhibits moisture loss from the skin, and subsequently testing skin previously treated with such moisturizing composition for the presence of the active material remaining on the previously treated skin, the presence of which active material is directly correlated to the amount of moisturizer composition remaining on the skin.

4,690,816

TYPE SOFT CAPSULE

Takehisa Hata, Mukou; Nobuto Kanagawa, Kyogo; Takashi Morishita, and Toshiyuki Suzuki, both of Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd. and Morishita Jintan Co., Ltd., both of Osaka, Japan

Continuation of Ser. No. 534,109, Sep. 20, 1983, abandoned. This application Nov. 18, 1985, Ser. No. 798,360

Claims priority, application Japan, Sep. 20, 1982, 57-164706

Int. Cl.⁴ A61K *9/48*

U.S. Cl. 424—456 **2 Claims**

1. A soft capsule which is prepared by wrapping an oily substance which is a member selected from the group consisting of tricaprylic acid glyceride and sesame oil, with a gelatin film containing sodium picosulfate.

4,690,817

QUATERNARY NITROGEN CONTAINING POLYVINYL ALCOHOL POLYMERS FOR USE IN SKIN CONDITIONING, COSMETIC AND PHARMACEUTICAL FORMULATIONS

Ronald I. Davis; Charalambos J. Phalangas, and George R. Titus, all of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 540,041, Oct. 7, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,239

Int. Cl.[4] A61K *7/06, 7/08, 7/021, 7/44*

U.S. Cl. 424—70 5 Claims

1. In an improved aqueous hair and skin conditioning composition comprising an oil phase, a water phase, and 0.05% to about 8% of an emulsifier wherein the improvement comprising reducing moisture loss with an aqueous solution containing 0.1 to 30% by weight of a quaternary nitrogen modified polyvinylalcohol polymer having a molecular weight ranging from at least 2,000 up to about 200,000 and which comprises a polyvinyl alcohol having oxygen-linked pendant groups of the formula —R—$NR_1R_2R_3A$— wherein R is selected from the group consisting of alkylene, hydroxy substituted alkylene and an acylene radical of formula weight ranging from 14 to about 3000, R_1, R_2 and R_3 are selected from the group consisting of alkyl and arylalkyl having 1–20 carbon atoms, A^-, is an anion, said polymers having a total nitrogen ranging from 0.01–7% by weight.

4,690,818

SHAMPOO AND BATH AND SHOWER GEL

Eugene Puchalski, Jr., Jersey City; Emil F. Schneider, Long Branch; Judith A. Cohee, Atlantic Highlands, and El-Sayed El-Menshawy, Holmdel, all of N.J., assignors to Charles of the Ritz Group Ltd., New York, N.Y.

Filed Feb. 3, 1986, Ser. No. 825,169

Int. Cl.[4] A61K *7/06*

U.S. Cl. 424—70 15 Claims

1. A shampoo or bath and shower gel composition having excellent conditioning and moisturizing properties and substantivity comprising a combination of from about 0.05 to about 2% by weight of (A) cocodimonium hydrolyzed keratin, and from about 0.001 to about 5% by weight of (B) a mixture of monosaccharides and disaccharides in natural combination with amino acids which includes hexylene glycol, glucose, fructose, sucrose, urea, dextrin, alanine, glutinic acid, aspartic acid and hexyl nicotinate in a wt. ratio of (A) to (B) within the range of from about 0.001:1 to about 5:1, and from about 10 to about 60% by weight water, from 0 to about 5% by weight thickener, from 5% to about 60% by weight cleanser or detergent, from 0.001 to about 0.5% by weight acid to adjust pH to appropriate levels, from 0.001 to about 0.5% by weight chelating agent, from 0.01 to about 5% by weight of conditioner, preservative, from 0.001 to about 1% by weight viscosity adjuster or feel enhancer, from about 0.01 to about 5% by weight of hydrolyzed animal protein, and from 0.001 to about 5% by weight humectant or emollient.

4,690,819

METHOD FOR STABILIZING RUBELLA HA ANTIGEN

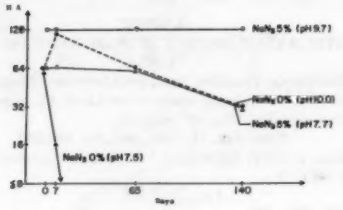
Akihiko Sato; Akira Noto; Fumiaki Morita, all of Osaka, and Kunihiro Nakajima, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Oct. 28, 1985, Ser. No. 792,316

Claims priority, application Japan, Dec. 14, 1984, 59-264863

Int. Cl.[4] A61K *39/00*

U.S. Cl. 424—88 8 Claims



1. A method for stabilizing inactivated rubella HA antigen which comprises adjusting an inactivated rubella HA antigen suspension at pH 9.6 or higher.

4,690,820

HIGH-CALORIC, HIGH-FAT DIETARY FORMULA

Vlado Simko, Staten Island, N.Y., assignor to The State University of New York, Albany, N.Y.

Filed Jun. 7, 1985, Ser. No. 742,299

Int. Cl.[4] A61K *33/42, 33/30, 33/06, 31/00*

U.S. Cl. 424—128 10 Claims

1. A high caloric, high fat dietary composition having 2.5/3.6 Kcals/ml. and deriving 45–75% of its calories from fat which comprises:

120–325 grams/liter fat;

56–69 grams/liter protein; and

168–207 grams/liter carbohydrate.

4,690,821

TOWEL FOR SKIN MOISTURIZING AND DRYING

James A. Smith, Old Tappan, and Betty J. Murphy, Upper Montclair, both of N.J., assignors to Creative Products Resource Associates, Ltd., Fort Lee, N.J.

Continuation of Ser. No. 579,033, Feb. 10, 1984, abandoned. This application Mar. 28, 1986, Ser. No. 846,508

Int. Cl.[4] A61K *6/00*

U.S. Cl. 424—401 11 Claims

1. A cosmetic applicator comprising a porous fibrous or cellular substrate sheet coated with a water-free composition consisting essentially of emollient oils, said oils including:

(a) about 35–60% of hydrophillic emollient oils including:

(i) about 25–35% of a polyoxyethylene, (C_{15}–C_{22}) fatty acid glycerate wherein the polyoxyethylene moiety comprises about 5–10 ethylenoxy moieties;

(ii) about 5–10% of a C_6–C_{12} acid diester of propylene glycol; and

(iii) about 1–5% of a C_{12}–C_{18} fatty acid, C_{12}–C_{18} fatty alcohol ester-alkoxylate of a polyethylene glycol comprising about 2–5 ethylenoxy units; and

(b) about 40–60% of a mixture of hydrophobic emollient oils including:

(i) about 15–25% of a benzyl alcohol ester of a C_{10}–C_{20} fatty acid;

(ii) about 10–25% of a C_{12}–C_{15} alkyl benzoate;

(iii) about 7–20% of a C_2–C_5 alkanol ester of dimer acid, trimer acid or mixtures thereof, wherein the interstices between the fibers or the cells of the substrate sheet are substantially free of the composition so that when the applicator is pressed against wet skin under conditions

of pressure, the water is absorbed and an emollient film is deposited on said skin, wherein all percentages are by weight of the composition.

4,690,822

NOVEL DRUG CARRIER AND PHARMACEUTICAL PREPARATION COMPRISING THE SAME

Toshinobu Uemura, Kishiwada; Toshiaki Okhuma, Osaka; Kiyohide Shinooka, Nishinomiya; Hiroshi Ishikuro, Ikeda, and Yoshio Ueda, Koube, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Mar. 12, 1986, Ser. No. 839,077

Claims priority, application United Kingdom, Mar. 26, 1985, 8507779

Int. Cl.[4] A61K *9/66, 9/52, 9/48*

U.S. Cl. 424—455 **6 Claims**

1. A pharmaceutical oral capsule preparation filled with a substantially anhydrous mixture which is in solid or semi-solid form comprising:

(a) a drug or a drug treated by a conventional manner, each of which is in solid form, and

(b) a drug carrier which is a semi-solid mixture comprising an aqueous polymer selected from the group consisting of polyethylene oxide, polyvinyl alcohol, polyvinyl pyrrolidone, hydroxypropylmethylcellulose, methylceullose, ethylcellulose, hydroxyethylcellulose, hydroxypropylcellulose, sodium carboxymethylcellulose, dextran, gelatin, pectin, sodium poly(acrylic acid), carboxypolymethylene, poly-L-lysin, pullulan, sodium alginate, chitosan, acacia, gum tragacanth, xanthan gum, guar gum and karaya gum, and liquid oil selected from the group consisting of arachis oil, cottonseed oil, sesame oil, medium chain monoglyceride, medium chain diglyceride, medium chain triglyceride, liquid paraffin, squalene, squalane, oleic acid, linoleic acid, ethylene glycol, propylene glycol and glycerin, the ratio of aqueous polymer to liquid oil by weight being 2:1 to 1:40.

4,690,823

IBUPROFEN-CONTAINING SOFT GELATIN CAPSULES AND PROCESS FOR PREPARING SAME

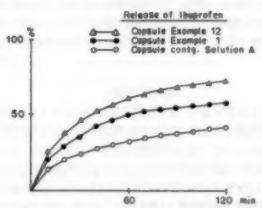
Manfred Lohner, and Klaus Posselt, both of Bonn, Fed. Rep. of Germany, assignors to Dolorgiet Beteiligungs-GmbH, St. Augustin, Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,727

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437599

Int. Cl.[4] A61K *31/19, 9/48*

U.S. Cl. 424—456 **18 Claims**



1. An ibuprofen-containing soft gelatin capsule containing a solution of from 15 to 30 parts by weight of ibuprofen in from 70 to 85 parts by weight of a polyoxyethylene-polyoxypropylene polymer having a molecular weight of 1400 to 2000.

4,690,824

SOLID PHARMACEUTICAL FORMULATIONS FOR SLOW, ZERO ORDER RELEASE VIA CONTROLLED SURFACE EROSION: EXPANDED RANGE

David R. Powell, and Vithal K. Patel, both of Baudette, Minn., assignors to Redi-Rowell, Inc., Atlanta, Ga.

Division of Ser. No. 511,605, Jul. 7, 1983, Pat. No. 4,539,198. This application May 22, 1985, Ser. No. 736,737

Int. Cl.[4] A61K *9/22, 9/26*

U.S. Cl. 424—468 **24 Claims**

1. A solid, orally administrable pharmaceutical tablet composition from which the active ingredient has a slow, zero-order release rate attained without layers, beads or enteric materials and without relatively insoluble polymers, waxes or gums when administered orally, said tablet being compressed to a hardness of about 5–20 kg, and being either shaped as a sphere, or else having a ratio of tablet thickness to tablet diameter effective to permit tablet erosion and penetration control sufficient for controlled surface erosion thereof, comprising an essentially homogeneous, granulated mixture of:

(a) an effective amount in the range of about 10–90 wt. % of a pharmacologically active compound having a water solubility (20° C.) of less than 1/560 to 1/1000 (w/w);

(b) about 1–40 wt. % of a surface controlling compound which is pharmaceutically acceptable in oral compositions and has a water solubility (20° C.) of about 1/1–1/40 (w/w);

(c) about 2–20 wt. % of an erosion controlling compound which is pharmaceutically acceptable in oral compositions and has a water solubility of about 1/1–1/10 (w/w);

(d) an amount in the range of about 0.05–1.0 wt. %, of a surface activator which is a disintegrating agent for pharmaceutical compositions at which amount the compound is ineffective as a disintegrating agent;

(e) about 0.1–2.0 wt. % of a surfactant which is pharmaceutically acceptable in oral compositions, and,

as necessary for tablet manufacturing purposes;

(f) about 1–20 wt. % of a binder which is pharmaceutically acceptable in oral compositions; or

(g) about 0.5–5.0 wt. % of a die wall lubricant which is pharmaceutically acceptable in oral compositions;

the pharmacologically active ingredient thus having a slow, zero-order release rate when administered orally, and the pharmacologically active compound not being a lithium compound, and not being penny shaped or pancake shaped wherein the ratio of thickness to diameter is too small for erosion and penetration control.

4,690,825

METHOD FOR DELIVERING AN ACTIVE INGREDIENT BY CONTROLLED TIME RELEASE UTILIZING A NOVEL DELIVERY VEHICLE WHICH CAN BE PREPARED BY A PROCESS UTILIZING THE ACTIVE INGREDIENT AS A POROGEN

Richard Won, Palo Alto, Calif., assignor to Advanced Polymer Systems, Inc., Redwood City, Calif.

Filed Oct. 4, 1985, Ser. No. 784,382

Int. Cl.[4] C08J *9/28*

U.S. Cl. 424—501 **80 Claims**

1. A composition of matter useful as a time-release delivery vehicle for delivering an active ingredient by controlled time

release, comprising a porous polymeric bead having a network of pores with the active ingredient held within the network of

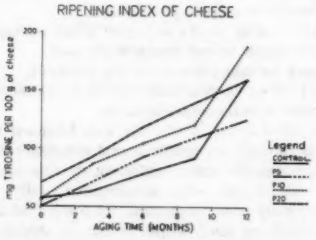
pores, said network of pores being substantially non-collapsible upon removal of the active ingredient.

4,690,826

BACTERIAL ENZYME USED AS CHEESE RIPENING AID

Norman F. Haard, Outer Cove, and Thakor R. Patel, St. Johns, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 15, 1986, Ser. No. 863,443
Int. Cl.[4] A23C *19/02*
U.S. Cl. 426—36 **15 Claims**



1. In a process for preparing Cheddar cheese which comprises treating a milk starting material with a coagulant to cause the milk starting material to form into solid curds and liquid whey, separating the solid curds from the liquid whey and treating said curds to form a Cheddar cheese product, and ripening said cheese product by allowing the product to age at a controlled temperature, the improvement which comprises adding a protease derived from bacteria of the species *Pseudomonas fluorescens* to said milk starting material in an amount of at least about 5 mg/L as a ripening aid prior to the formation of said solid curds.

4,690,827

FRUIT JUICE CONTAINING DIET BEVERAGE

Philip L. Kupper, Cincinnati, Ohio; Katherine L. Moore, Brussels, Belgium, and Robert L. Swaine, Jr., Springdale, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 31, 1985, Ser. No. 760,885
Int. Cl.[4] A23L *2/02, 1/236*
U.S. Cl. 426—548 **7 Claims**

1. A process for preparing an artificially sweetened orange juice containing beverage with reduced artificial sweetener unpleasant aftertaste, said process comprising the steps of

forming an admixture comprising from about 5% to about 100% orange juice, from 0 to about 95% water, a sweetening amount of an artificial sweetener, and an amount of fruit pulp to provide in the orange juice containing beverage, upon particle size reduction of the pulp, a percentage background pulp volume at least twenty percent higher than that of said original orange juice,

reducing the fruit pulp to a particle size such that the particles pass through a 20 mesh sieve whereby said pulp reduces unpleasant aftertaste caused by said artificial sweetener.

4,690,828

COAGULATED FOOD MADE FROM BROWN ALGAE

Nagako Kitahara, 17-19 Vamanotachuocho, Shimonoseki-shi, Yamaguchi, 751, Japan

PCT No. PCT/JP85/00186, § 371 Date Dec. 11, 1985, § 102(e) Date Dec. 11, 1985
PCT Filed Apr. 11, 1985, Ser. No. 815,707
Claims priority, application Japan, Apr. 11, 1984, 59-73796
Int. Cl.[4] A23L *1/04*
U.S. Cl. 426—575 **3 Claims**

1. A coagulated food product made from brown algae comprising:

at least two different kinds of brown algae, the food product is prepared by dissolving a first kind of brown alga in a chelating agent to form a viscous liquid which is interspersed with fibrous, solid portions of the brown algae which are undissolved,

mixing the viscous liquid and interspersed fibrous, solid portions of undissolved brown algae with finely divided particles of a second brown algae,

coagulating the mixture by immersion into a chemical which will cause coagulation,

and leaching the coagulated mixture with water.

4,690,829

METHOD OF PREVENTING RETROGRADATION OF FOODSTUFFS

Takayuki Usui, Kanazawa, Japan, assignor to Mitsui & Co., Ltd., Tokyo, Japan

PCT No. PCT/JP84/00314, § 371 Date Feb. 4, 1985, § 102(e) Date Feb. 4, 1985, PCT Pub. No. WO85/00004, PCT Pub. Date Jan. 3, 1985
PCT Filed Jun. 15, 1984, Ser. No. 704,315
Claims priority, application Japan, Jun. 16, 1983, 58-108242
Int. Cl.[4] A21D *2/08*
U.S. Cl. 426—661 **1 Claim**

1. A method of preventing the retrogradation of foodstuffs containing starchy material, wherein waxy barley starch or waxy barley flour having an amount of waxy barley starch within the range of 2 to 50 wt.% of the starchy material, is used as part of said starchy material, and, wherein at least one polysaccharide selected from the group consisting of an oligosaccharide, dextrin, carrageenin, pectin, locust bean gum, guar gum, tamarind tum and xanthane gum is added thereto, wherein the amount of the polysaccharide to be added is within the range of 0.5 to 15 wt.% of the starchy material.

4,690,830

ACTIVATION BY DEHYDROGENATION OR DEHALOGENATION OF DEPOSITION FEEDSTOCK AND DOPANT MATERIALS USEFUL IN THE FABRICATION OF HYDROGENATED AMORPHOUS SILICON ALLOYS FOR PHOTOVOLTAIC DEVICES AND OTHER SEMICONDUCTOR DEVICES

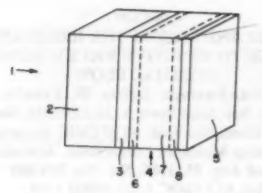
Charles R. Dickson, Trenton, N.J., and David E. Carlson, Yardley, Pa., assignors to Solarex Corporation, Rockville, Md.

Filed Feb. 18, 1986, Ser. No. 830,072
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 **64 Claims**

1. A process for preparing hydrogenated amorphous silicon alloy by deposition of hydrogenated amorphous silicon alloy

film onto a substrate in a deposition chamber comprising the steps of (a) introducing into the deposition chamber during deposition a deposition gas mixture which includes one or more compounds having the formula:

$$(MX_3)_n M' X_{4-n}$$



wherein M and M' are different Group 4A atoms selected from the group of silicon, germanium, tin and lead, at least one of M and M' is silicon, X is hydrogen, halogen or mixtures thereof, and n is an integer between 1 and 4, inclusive; and (b) activating said deposition gas mixture by dehydrogenation or dehalogenation.

4,690,831

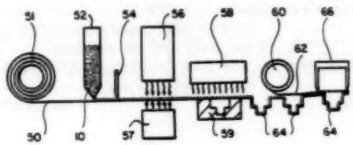
PROTECTIVE ARTICLE

William D. Uken, Fremont; Robert S. Dubrow, Redwood City; Carib Nelson, Palo Alto, and Catherine A. Dittmer, Mountain View, all of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Division of Ser. No. 730,699, May 2, 1985, Pat. No. 4,643,924, which is a continuation-in-part of Ser. No. 715,789, Mar. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 507,435, Jun. 23, 1983, abandoned. This application Jun. 18, 1986, Ser. No. 875,802

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—44 **18 Claims**



1. A method of making an article for protecting a substrate, comprising:

transporting a backing material past a gel dispenser;

dispensing a gel from the gel dispenser onto the backing; and deforming the backing and the gel into a predetermined shape such that at least a major portion of an inner surface of the backing has gel thereon, the shape being similar to an external surface shape of at least part of a substrate to be protected.

4,690,832

PROCESS FOR PROVIDING HYDROLYSIS RESISTANT PHOSPHORS

Ramon L. Yale, Ulster, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 729,374, May 1, 1985, abandoned. This application Dec. 9, 1986, Ser. No. 939,654

Int. Cl.[4] C09K *11/475*

U.S. Cl. 427—65 **11 Claims**

1. A process for making a rare earth oxysulfide phosphor resistant to hydrolysis, said process comprising:

(a) forming a slurry of said phosphor in water;

(b) adding to said slurry a sufficient amount of a source of silicon dioxide and a water soluble salt selected from the group consisting of alkaline earth metal salts, and transition group IIB metal salts, with agitation for a sufficient time to form a silicate coating on said phosphor, the cation of said water soluble salt becoming the cation of said silicate coating, the amount of said silicate coating being sufficient to impart hydrolysis resistance to said phosphor;

(c) separating the resulting silicate coated phosphor powder from the resulting liquor;

(d) heating said silicate coated phosphor powder at from about 100° C. to about 150° C. for a sufficient time in ambient atmosphere to remove essentially all of the water therefrom; and

(e) heating the resulting dried silicate coated phosphor powder at from about 400° C. to about 800° C. for a sufficient time in ambient atmosphere to produce the final hydrolysis resistant phosphor, said heating of the dried silicate coated phosphor powder effecting a phosphor exhibiting a greater hydrolysis resistance than said dried silicate coated phosphor powder absent this heating.

4,690,833

PROVIDING CIRCUIT LINES ON A SUBSTRATE

William A. Donson; James V. Ellerson, both of Endicott; Richard B. Hammer, Apalachin; William Lafer, Chenango Bridge, and Keith A. Snyder, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1986, Ser. No. 845,316

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—96 **17 Claims**

1. A process for providing circuit lines on a substrate wherein said substrate has non-planar areas which comprise:

applying a layer of photoresist material in a liquid form to said substrate;

selectively screen printing on non-planar areas of the substrate a screen printable coating wherein said screen printable coating has sufficient viscosity so as to resist pull back and thinning at the corners of the contoured surface to thereby prevent undercutting or voids;

photoprocessing said layer of photoresist material; and

providing predetermined electrically conductive pattern on said substrate.

4,690,834

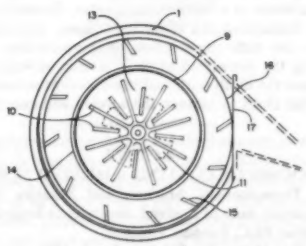
PROCESS FOR COATING SOLID PARTICLES

Curt H. Appelgren, Benjaminssons väg, Pl 1461, S-434 00 Kungsbacka, and Nemo Ivarsson, Skönviksvägen 253, S-122 42 Enskede, both of Sweden

Filed Jul. 30, 1986, Ser. No. 890,735

Int. Cl.[4] B05D *7/00;* **B29C** *67/00;* **C09C** *1/56;* **A01N** *25/00*

U.S. Cl. 427—189 **13 Claims**



1. A process for coating solid particles with a coating material which is highly viscous or solid at room temperature comprising:

(a) introducing the coating material in the form of a melt via a conduit to a hollow space in a rotating mixing disc;

(b) introducing the solid particles via a separate conduit to at least one separate space in said rotating mixing disc; and

(c) rotating the mixing disc to sweep the solid particles and the melt to the periphery of the mixing disc, the melt being forced from the hollow space through a slot in the mixing disc in a direction toward the upper surface of the disc so that the melt becomes a finely dispersed mist which contacts and forms a coating on the solid particles.

4,690,835

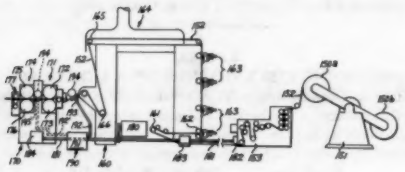
REINFORCED CONTAINER

Donald D. Halabisky, Tacoma, and Dwight A. Dudley, II, Federal Way, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Division of Ser. No. 616,464, Jun. 1, 1984, Pat. No. 4,586,643. This application Feb. 3, 1986, Ser. No. 825,125

Int. Cl.[4] B05D *3/12, 5/00*

U.S. Cl. 427—210 **6 Claims**



1. The process of reinforcing a polyethylene coated blank comprising

applying a reinforcing stripe to a polyethylene coated web along a longitudinal score line to be scored,

said reinforcing stripe comprising essentially

a major portion of polyethylene,

a small amount of vinyl acetate and

a polypropylene/polyisobutylene copolymer,

scoring said web along said line, and

cutting said blank from said web.

4,690,836

PROCESS FOR THE PRODUCTION OF VOID-FREE PREPREG SHEETS

Thomas C. Clarke, Morgan Hill, Calif.; Neng H. Lu, Endwell, N.Y.; Yaffa Tomkiewicz, Scarsdale, N.Y., and Ho M. Tong, Yorktown Heights, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 23, 1985, Ser. No. 790,566

Int. Cl.[4] B05D *1/18, 3/02;* **B32B** *5/02;* **D04H** *3/08*

U.S. Cl. 427—299 **7 Claims**

1. A method for reducing the void content in a prepreg sheet which is prepared by impregnating a reinforcing cloth with a solvent solution of a thermosetting resin, the method comprising first immersing the cloth in a liquid medium having a viscosity less than the solution of thermosetting resin, then immersing the prewetted cloth in a resin solvent solution to impregnate the cloth with said resin solvent solution and then heating the cloth to remove the solvent and cure the resin.

4,690,837

PROCESS OF COATING A HEATED SURFACE

Andrew Doroszkowski, Marlow, and Maurice W. Skinner, Maidenhead, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 689,968, Jan. 9, 1985, abandoned. This application Dec. 18, 1986, Ser. No. 943,879

Claims priority, application United Kingdom, Jan. 27, 1984, 8402191

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—314 **9 Claims**

1. A process of coating a surface of an article which is capable of being heated by contacting the heated surface of the article with a coating composition comprising an aqueous dispersion of an organic film-forming material which is sterically stabilised and which has a critical coalescence temperature which is lower than the temperature to which the surface of the article is heated so that the film-forming material is destabilised.

4,690,838

PROCESS FOR ENHANCING THE RESISTANCE OF A RESIST IMAGE TO REACTIVE ION ETCHING AND TO THERMAL FLOW

Hiroyuki Hiraoka, Saratoga; Jeffrey W. Labadie, Campbell; James H. Lee, San Jose; Scott A. MacDonald, San Jose, and Carlton G. Willson, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 25, 1986, Ser. No. 899,589

Int. Cl.[4] G03C *5/00;* **B05D** *3/04*

U.S. Cl. 427—343 **9 Claims**

1. A process for increasing the reactive ion etching and thermal flow resistance of a resist image, said process being characterized by contacting said resist image with a alkyl metal compound of magnesium or aluminum, the resist comprising a polymer which has a group which reacts with the alkyl metal compound to undergo metallization or salt formation.

4,690,839

METHOD FOR MANUFACTURING THICK ASPHALT SHEET

Takashi Iwasaki; Yasuo Tomita, and Tsunekazu Hayashi, all of Tokyo, Japan, assignors to Mitsuboshi Sangyo Co. Ltd., Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,192

Claims priority, application Japan, Jan. 26, 1984, 59-12946; Apr. 6, 1984, 59-69667

Int. Cl.[4] B05D *1/28, 3/12;* **B05C** *3/02, 3/12*

U.S. Cl. 427—366 **8 Claims**

2. A method for manufacturing a thick asphalt sheet comprising preparing a thick sheet material made of non-woven fabric of synthetic material, passing said sheet material through a series of three or four stages of pairs of heated pressing rolls from the upper side to the lower side of each pair of rolls and feeding and storing molten petroleum asphalt into concavities formed on the upper sides of the respective pairs of rolls, excluding the lowest stage of pair of rolls, whereby the molten petroleum asphalt is pressed into the sheet material when said material passes through said pairs of rolls.

4,690,840

PROCESS FOR PREPARING ALLOYED NEGATIVE ELECTRODES

Michel Gauthier, and Denis Fauteux, both of Quebec, Canada, assignors to Hydro-Quebec, Quebec, Canada and Societe Nationale Elf Aquitaine, Paris, France

Filed Apr. 4, 1985, Ser. No. 719,978

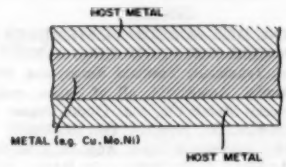
Claims priority, application Canada, Apr. 11, 1984, 451782

Int. Cl.[4] H01M *4/12, 4/40;* **B05D** *1/18*

U.S. Cl. 427—436 **73 Claims**

1. Method for the preparation of metallic alloys containing

an alkali or alkali-earth metal as well as a host metal, which comprises preparing an active organic solution of said alkali or alkali-earth metal in metallic form, as well as a source of said alkali or alkali-earth metal which are brought together, separately preparing a metallic structure containing said host metal and keeping said metallic structure separate from said source of alkali or alkali-earth metal, contacting together the metallic



structure with the organic solution the latter being kept in contact with the source of metal until formation of a superficial alloy of said host metal and of the alkali or the alkali earth metal with the metallic structure, and the alloy has an activity which is determined by that of the organic solution, said organic solution then serving as transfer agent of the alkali or alkali-earth metal towards the host metallic structure.

4,690,841

PYROLYTIC BORON NITRIDE ARTICLE

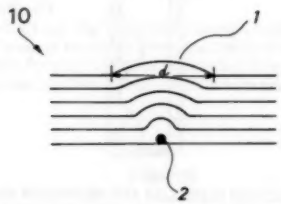
Hiroaki Tanji, Tokyo; Masaharu Suzuki, Machida; Kenji Nomura, Machida; Shojiro Watanabe, Machida, and Takashi Kawasaki, Machida, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1986, Ser. No. 831,247

Claims priority, application Japan, Feb. 28, 1985, 60-39532

Int. Cl.[4] B65D *1/00*

U.S. Cl. 428—35 **6 Claims**



1. A pyrolytic boron nitride article of uniform structure having a thickness of from 0.3 mm to 10 mm, comprising pyrolytic boron nitride deposited through a vapor phase by chemical vapor deposition using boron halide and ammonia as starting materials, said article having an overall surface and having nodules and/or traces thereof on the overall surface, the number of nodules and/or traces thereof each having a diameter of not less than 100 μm being:

(a) 0.5 or less/cm^2 in average all through the overall surface of the article; and

(b) 2 or less in any portion of a unit square centimeter on the overall surface of the article.

4,690,842

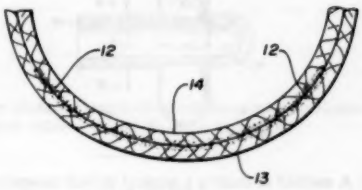
REINFORCED CASTING MATERIAL

Gene W. Kammerer, East Brunswick; Hee K. Yoon, North Brunswick, and Robert Li-Jiun Sun, Stanhope, all of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Continuation-in-part of Ser. No. 784,297, Oct. 7, 1985, Pat. No. 4,643,909. This application Jan. 20, 1987, Ser. No. 5,492

Int. Cl.[4] A61L *15/00*; A61F *13/00*

U.S. Cl. 428—35 **13 Claims**



8. A moisture impervious container having a volume of from 2 to 16 ounces and a sealable opening at one end filled with a liquid composition comprising an aromatic polyisocyanate and a polyol in an equivalent ratio of from 2.1 to 15.1, a catalyst in an amount of from 0.1 to 10% based on the weight of the composition, an antifoam agent in an amount of from 0.7 to 7.5% based on the weight of the composition, a thickening agent in an amount of from 2 to 5% by weight of the composition, from 0.5% to 2% by weight mineral oil and a 0.5% to 3% by weight of a water soluble polymer selected from the group consisting of polyvinylpyrrolidone having a molecular weight of from 100,000 to 1,000,000 and a polymer having repeating units of the structure $(O—CH_2CH_2)_n$ where n is an integer such that the molecular weight of the water soluble polymer is from 50,000 to 4,000,000, said composition having a viscosity of between 100,000 and 1,000,000, and said composition capable of foaming in a ratio of from 4 to 1 to 16 to 1.

4,690,843

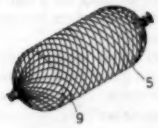
CASINGS FOR HAM AND SAUSAGE

Hiromichi Inagaki, 1-143, Aza Maedaomote, Inuyama-shi, Aichi-ken, Japan

Filed Feb. 19, 1986, Ser. No. 831,149

Int. Cl.[4] F16L *11/00*; B32B *3/12*

U.S. Cl. 428—36 **13 Claims**



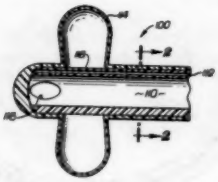
1. A casing for use in enclosing ham and sausage, comprising a heat shrinkable base film having an inner surface and an outer surface, a surface film having an inner surface adhered to said outer surface of said base film, a pattern of heat foamable ink forming an inner pattern between said outer surface of said base film and said inner surface of said surface films, said inner pattern being provided on one of said inner surfaces of said surface film and said outer surface of said base film whereby heating of said casing causes shrinkage of said shrinkable base film and expansion of said heat foamable ink to form a textured pattern on said outer surfaces corresponding to said pattern of foamable ink.

4,690,844

METHOD FOR PARTING RUBBER AND PRODUCTS FORMED THEREBY, AND A METHOD OF MAKING A BLOOD VESSEL

Abdul S. Saudagar, 12 Eastshore, Irvine, Calif. 92714

Filed Oct. 26, 1984, Ser. No. 665,295
Int. Cl.[4] F16L *11/04;* A01N *1/02;* B05D *3/02*
U.S. Cl. 428—36 **11 Claims**



1. A method of making a medical device comprising:
providing a rubber substrate;
coating a portion of the substrare with parting agent selected from the group consisting of polyvinyl pyrrolidone, a water soluble grade of polyvinyl alcohol, methylcellulose, starch derivatives, and dextran;
applying rubber in solution over the parting agent coating; and
drying the rubber solution and coating at a temperature sufficient to cause the coating to become brittle.

4,690,845

METHOD AND APPARATUS FOR LAMINATING FLEXIBLE PRINTED CIRCUITS

Thomas M. Kloss, Jr., Newtown, Pa., assignor to Gila River Products, Inc., Chandler, Ariz.

Continuation of Ser. No. 582,303, Feb. 22, 1984, abandoned. This application Oct. 28, 1985, Ser. No. 793,452
Int. Cl.[4] A61F *13/02;* B32B *7/02, 27/00;* C09J *7/02*
U.S. Cl. 428—40 **15 Claims**

1. A stratiform press sheet for use in laminating three dimensional flexible printed circuits on a flat bed press, said press sheet having its component layers bonded together to form a unified sheet containing:
(a) a median layer comprising a polymeric thermoplastic film having a glass transition point lower than the laminating temperature peak, a melting point higher than the laminating temperature peak, and a thickness at the laminating temperature peak at least as great as the differences between the peaks and valleys in the cross-section of the three-dimensional flexible printed circuit for uniform transmission of pressure in said laminating process;
(b) a polymeric release layer having a thickness of from 0.1 to 4 mils and having an outer surface for releasable disposition against a printed circuit which is being laminated;
(c) an outer polymeric stabilizing layer having a melting point higher than the laminating temperature peak and being formed as an integral part of said unified press sheet in order to prevent lateral movement of said thermoplastic film when in a plastic state in said laminating process; and
(d) adhesive means to bond the component layers in a single, stratiform press sheet,
said press sheet being further characterized by substantial freedom from creases, entrapped gases, and contaminants between said layers.

4,690,846

RECORDING DISK SUBSTRATE MEMBERS AND PROCESS FOR PRODUCING SAME

Toshiaki Wada, Takatsuki; Yoshiaki Katsuyama, Muro, and Junichi Nakaoka, Amagasaki, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Filed Jul. 26, 1985, Ser. No. 759,366
Claims priority, application Japan, Aug. 15, 1984, 59-169409
Int. Cl.[4] H01F *10/02;* B05D *1/38;* B32B *7/02*
U.S. Cl. 428—64 **8 Claims**

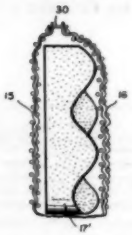
1. A substrate member for recording disk characterized in that a glass coating film is provided on an alumina base ceramic material having micropores of no larger than 5 microns and a relative theoretical density of no less than 96%, said glass coating film having a surface roughness of no more than 80 angstroms, being substantially pore-free and strain-free on the surface, and having a thickness of 0.3 to 200 microns and a relative difference of no more than 10^{-6}/deg in the coefficient of thermal expansion with respect to said alumina base ceramic material.

4,690,847

COLD WEATHER GARMENT STRUCTURE

B. Dean Lassiter, and Vincent F. Ambrosiani, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jun. 26, 1986, Ser. No. 879,053
Int. Cl.[4] B32B *3/26, 5/18*
U.S. Cl. 428—71 **20 Claims**



11. A cold-weather garment consisting of: an interior lining fabric; an outer fabric; a layer of open cell foam at least ¼ inch thick between the interior lining fabric and the outer fabric; and the lining, foam layer, and outer fabric connected together by connecting means to form a garment; and wherein:
said layer of foam sheet comprises a non-flat foam sheet, said non-flat foam sheet having increased flexibility and reduced material and weight, and having added surface area for moisture transfer during sweating of the wearer, compared to a flat foam sheet.

12. A garment as recited in claim 11 wherein said non-flat foam sheet comprises a sheet having a first, flat face, and a second, convoluted face.

4,690,848

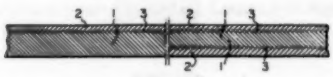
WEATHER-RESISTANT LIGNOCELLULOSE OR OTHER ORGANIC OR INORGANIC MATERIAL BOARDS AND PROCESS FOR THEIR PRODUCTION

Reinhard F. Hering, via Alberedo 34, CH 6645 Brione Sopra Minisio, Switzerland

Continuation-in-part of Ser. No. 434,834, Oct. 14, 1982, Pat. No. 4,562,103, which is a continuation-in-part of Ser. No. 74,669, Oct. 23, 1979, abandoned. This application Oct. 7, 1985, Ser. No. 785,198

Int. Cl.[4] B32B *1/04*

U.S. Cl. 428—74 17 Claims



1. A weather-resistant impregnated board possessed of surface elasticity and pliancy by means of a permanently elastic covering layer comprising: an impregnatable porous base material selected from the group consisting of (a) an organic lignocellulose or other organic fibrous or particle material; (b) an inorganic mineral fibrous or particle material; and (c) a mixture of an organic lignocellulose or other organic fibrous or particle material and an inorganic mineral fibrous or particle material; and a vulcanized outer covering layer constituted by a vulcanized weather-resistant, resilient synthetic elastomeric material which has been vulcanized thereon in situ at a temperature of at least 175° C.; said vulcanized outer covering layer being both adhered securely to one outer surface of said base material, and when in unvulcanized form, penetrated and impregnated below and into the same outer surface of said base material to be within the porous structure of said base material for only a predetermined limited region in the vicinity of said outer surface of said base material, and being vulcanized therein in situ at a temperature of at least 175° C.

4,690,849

CONTACT MATERIAL FOR TREATING SEWAGE OF BRAIDED PILE MATERIAL

Ken Fukuda, and Hisaaki Ueba, both of Mibu, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Kureha Gosen Kabushiki Kaisha, Shimotsuga, both of, Japan

Filed Jun. 18, 1986, Ser. No. 875,681

Claims priority, application Japan, Jun. 21, 1985, 60-135405

Int. Cl.[4] B32B *3/02*

U.S. Cl. 428—91 8 Claims

1. A contact material for treating sewage, comprising a braid which is made of synthetic fibers and has loop piles, said synthetic fibers forming said loop piles being from 40 to 90% by weight of said synthetic fibers of the whole braid.

4,690,850

FIBER REINFORCED BRAIDED SKI CORE AND METHOD AND APPARATUS FOR MAKING SAME

Louis J. Fezio, Vashon Island, Wash., assignor to K-2 Corporation, Vashon Island, Wash.

Filed Jun. 6, 1986, Ser. No. 871,443

Int. Cl.[4] B32B *5/12, 17/02;* A63C *5/00*

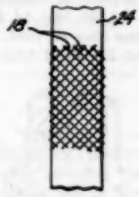
U.S. Cl. 428—105 50 Claims

1. A wrapped ski core comprising:

a longitudinal core, and,

a plurality of continuous strands of a first set of fibers helically surrounding said core said fibers braided snugly thereon, conforming to the surface of said core; said braided strands of the first set of fibers being biased at an angle with respect to the longitudinal dimension of said core.

14. The wrapped core of claim 1, wherein the angle of said strands of the first set of fibers with said longitudinal ski core



is changed along the length of said ski to vary the torsional and longitudinal stiffness of said ski along its length.

4,690,851

FABRIC BASED ON GLASS AND CARBON FIBERS AND ARTICLES COMPRISING SUCH A FABRIC

Hervé Auduc, Jonage, and Jean Aucagne, La Tour du Pin, both of France, assignors to Brochier S.A., Decines Charpieu, France

Filed Oct. 6, 1986, Ser. No. 915,792

Claims priority, application France, Oct. 16, 1985, 85 15328

Int. Cl.[4] B32B *3/12*

U.S. Cl. 428—116 10 Claims

1. A fiber-based fabric having a high fire resistance, a low weight per unit area and a good mechanical strength, comprising a mixture of:

(a) about 50–90% by weight of textured glass fibers,

(b) about 10–50% by weight of carbon fibers.

4,690,852

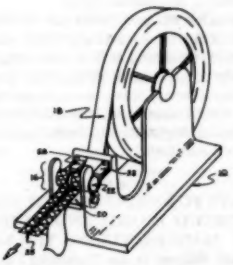
FOIL FOR STAINED GLASS ASSEMBLY

A. Katherine Hull, Grosse Pointe, Mich., assignor to Paul Gach, St. Clair Shores, Mich.

Filed Jun. 11, 1985, Ser. No. 743,392

Int. Cl.[4] B32B *3/00;* B44C *5/08*

U.S. Cl. 428—156 3 Claims



1. A metallic foil ribbon for use in fabrication of panels and articles from stained glass, said ribbon comprising:

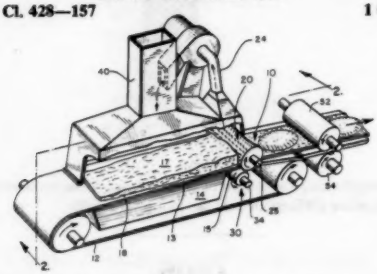
a solder supportive foil ribbon having an essentially uniform width, a coated surface and an uncoated surface, said coated surface having thereon a pressure-sensitive adhesive and said uncoated surface being provided with embossment essentially along its entire length so as to reference the center line of said ribbon along its length, said embossment being visible from the adhesive coated surface.

4,690,853

ABSORBENT STRUCTURE CONTAINING A CONTOURED BATT

Philip G. Hammond, Outagamie County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 711,789, Mar. 14, 1985, Pat. No. 4,626,184.
This application May 19, 1986, Ser. No. 864,352
Int. Cl.[4] B32B *3/02, 7/00*
U.S. Cl. 428—157 1 Claim



1. An absorbent structure for a disposable absorbent garment comprising:
a liquid impermeable backing sheet;
a liquid permeable facing sheet; and
an airlaid batt having uniform density disposed between the backing and facing sheets, said batt having an integrally formed, longitudinally and transversely contoured, scarfed surface wherein said batt is thicker in the central portions than in the marginal side and end portions, respectively, thereof.

4,690,854

ELECTRICALLY CONDUCTING MATERIAL AND METHOD OF PREPARING SAME

Shinji Tomibe, Kyoto; Reizo Gomibuchi, Uji; Kiyofumi Takahashi, Yahata, and Noboru Kato, Joyo, all of Japan, assignors to Nihon Sanmo Dyeing Co., Ltd., Japan

Filed Sep. 18, 1985, Ser. No. 777,270
Int. Cl.[4] B05D *3/10, 5/12;* B32B *15/08;* C08J *7/00*
U.S. Cl. 428—195 15 Claims

1. An electrically conducting material comprising a water-insoluble, solid polymeric substrate containing at least 0.01 weight %, when calculated as sulfur or nitrogen atom, of a group selected from mercapto, thiocarbonyl, quaternary ammonium salt, amino and isocyanato, and copper sulfide bound to said polymeric substrate.

7. A process for the preparation of an electrically conducting material, comprising treating a water-insoluble, solid polymeric substrate containing at least 0.01 weight %, when calculated as sulfur or nitrogen atom, of a group selected from mercapto, thiocarbonyl, quaternary ammonium salt, amino and isocyanato with a source of monovalent copper ions and a sulfur-containing compound to form copper sulfide bound to said polymeric substrate.

4,690,855

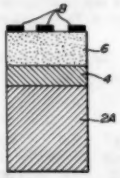
SUBSTRATE FOR PRINT CIRCUIT BOARD, A PRINT CIRCUIT BOARD, AND METHOD OF MANUFACTURING THE SAME

Yukio Inokuti; Shigeko Ikeda; Toshihiko Funahashi, and Yo Ito, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 664,587, Oct. 25, 1984, abandoned.
This application Sep. 10, 1986, Ser. No. 906,599
Claims priority, application Japan, Dec. 28, 1983, 58-251746
Int. Cl.[4] B32B *15/04, 15/16;* B05D *3/07, 1/12*
U.S. Cl. 428—209 16 Claims

1. A substrate for print circuit board comprising a steel sheet which contains 1.0–8.0% of Si, and a forsterite film layer on at least one surface of the steel sheet, and an insulating film layer disposed on the forsterite film layer, said insulating film layer being in the form of a baked solution of a phosphate and colloidal silica, the forsterite film layer being in the form of the reaction product of MgO in an annealing separator applied onto the steel sheet and SiO_2 in the silicon steel sheet.

7. A print circuit board comprising a steel sheet which contains 1.0–8.0% of Si, and a forsterite film layer formed on at least one surface of the steel sheet, and an insulating film layer



disposed on the forsterite film layer, said insulating film layer being in the form of a baked solution of a phosphate and a colloidal silica, and a conductive pattern bonded on the surface of said insulating film layer, the forsterite film layer being in the form of the reaction product of MgO in an annealing separator applied onto the steel sheet, and SiO_2 in the silicon steel sheet.

4,690,856

METAL POLYAMIDE ADHESIVE LAMINATES

Bunsaku Ito; Kimio Fukuda, and Rikio Hara, all of Hirakata, Japan, assignors to Ube Industries, Inc., Yamaguchi, Japan

Filed Dec. 26, 1985, Ser. No. 813,596
Claims priority, application Japan, Dec. 27, 1984, 59-273973
Int. Cl.[4] B32B *7/02, 15/08*
U.S. Cl. 428—215 5 Claims

1. A laminate comprising a metal material laminated on at least one surface of an adhesive layer, said adhesive layer being composed of a polyamide adhesive composition comprising 100 parts by weight of a polymer component and 0.1 to 5 parts by weight of an aminosilane compound, said polymer component comprising 50 to 99.5% by weight of a polyamide and 0.5 to 50% by weight of a modified polyolefin formed by grafting a polyolefin with an unsaturated compound having a polar group in the molecule and/or a polymer other than polyamides, having a polar group or an aromatic group and a tensile modulus not higher than 2,000 kg/cm^2.

2. A laminate according to claim 1, which has a structure composed of a metal layer/a polymer core layer/a metal layer and having a thickness of 0.3 to 1.5 nun; said polymer core layer having a thickness of 0.01 to 10 mm and being composed of either a single layer of the polyamide adhesive composition or a three layer structure of the polyamide adhesive composition layer/a resin layer/the polyamide adhesive composition layer, each polyamide adhesive layer in said three layer structure having a thickness of 5 to 100 μm.

4,690,857

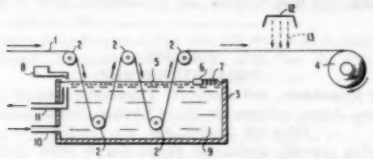
MAGNETIC RECORDING MEDIUM

Ryuji Shirahata, and Yasuo Tamai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 14, 1985, Ser. No. 765,485
Claims priority, application Japan, Aug. 14, 1984, 59-169858; Aug. 14, 1984, 59-169861
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—216 13 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon, in sequence, a thin ferromagnetic metal film, and at least one monomolecular layer comprising a saturated fatty acid salt of at least one metal selected from the group consisting of Cd, Co, Mn and Pb, or a polymer of a fatty acid or a derivative thereof, wherein the monomolecular layer comprising a saturated fatty acid salt of the at least

one metal is prepared by a Langmuir Blodgett method and wherein the monomolecular layer comprising a polymer of a



fatty acid or a derivative thereof is a Langmuir Blodgett polymerized layer.

4,690,858

THERMAL TRANSFER SHEET

Hiroyuki Oka; Shinichi Akasaka; Shuichi Ohara; Shintaroo Hattori; Yasuki Mori, all of Hitachi; Toshikazu Narahara, Ibaraki, and Hiroshi Matsumoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Nitto Electric Industrial Co., Ltd., Osaka, both of, Japan

Filed Feb. 13, 1986, Ser. No. 828,974

Claims priority, application Japan, Feb. 15, 1985, 60-26311; Mar. 15, 1985, 60-50336

Int. Cl.[4] B41M *5/26*

U.S. Cl. 428—216 **16 Claims**

1. A thermal transfer recording sheet comprising a substrate and an ink layer formed thereon containing one or more sublimable dyes and a binder, said binder being a high-molecular-weight polyamide obtained from dimer acids and having a softening point of 100° C. or higher.

4,690,859

FIRE BARRIER FABRICS

Rick A. Porter, North Augusta, S.C., and Hans R. Hoernle, Augusta, Ga., assignors to United Merchants & Manufacturers Inc., New York, N.Y.

Filed Apr. 9, 1985, Ser. No. 721,307

Int. Cl.[4] B32B *3/00, 17/10*

U.S. Cl. 428—251 **28 Claims**

1. A breathable fire barrier fabric comprising a woven fiber glass fabric on which is coated an encapsulating coating that minimizes or eliminates fiber to fiber self-abrasion and effectively adheres to the glass fabric even when subjected to heat and flames; said fire barrier fabric having a porosity value at an acceptable level such that the fire barrier fabric inhibits the spread of fire.

4,690,860

FIBRE REINFORCED COMPOSITE PLASTICS MATERIAL

Bronislaw Radvan, Flackwell Heath, and Andrew Till, Marlow, both of England, assignors to The Wiggins Teape Group Limited, Basingstoke, England

Continuation of Ser. No. 884,306, Jul. 15, 1986, abandoned, which is a continuation of Ser. No. 688,806, Jan. 4, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 946,630

Claims priority, application United Kingdom, Jan. 6, 1984, 8400294

Int. Cl.[4] B32B *5/14, 5/22, 27/04;* **B27N** *3/10*

U.S. Cl. 428—290 **13 Claims**

1. A fibre reinforced plastics structure, comprising:

a porous matrix comprising 40% to 60% by weight of thermoplastic material and 20% to 60% by weight of single reinforcing fibres having a high modulus of elasticity, and being between about 7 and 50 millimeters long, the matrix having pores and a surface; and

a cured thermoset plastics material investing at least the pores at the surface of said matrix.

4,690,861

MAGNETO OPTICAL RECORDING MEDIUM

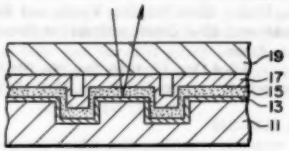
Hitoshi Nakamura; Yujiro Kaneko; Yasuo Sawada, all of Numazu; Hajime Machida, Tokyo; Fumiya Omi, and Atsuyuki Watada, both of Numazu, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1986, Ser. No. 832,373

Claims priority, application Japan, Mar. 11, 1985, 60-46647

Int. Cl.[4] G11B *9/00*

U.S. Cl. 428—623 **37 Claims**



1. A magneto-optical recording medium comprising a substrate and a reflective layer, a dielectric undercoat layer and a hexagonal magnetoplumbite metal oxide magnetic layer laminated thereon in order, wherein the crystal misfit between said reflective layer and said dielectric undercoat layer formed thereon is within ±30% of the atomic surface distance of the reflective layer, and wherein the crystal misfit between said dielectric undercoat layer and said hexagonal magnetoplumbite metal oxide magnetic layer is within ±30% of the atomic surface distance of the dielectric undercoat layer.

4,690,862

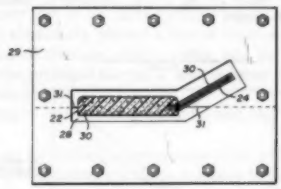
INTEGRAL COMPOSITE PROFILE OF CELLULAR AND NON-CELLULAR RESINS AND A DUAL EXTRUSION METHOD FOR ITS MANUFACTURE

Daniel J. Hoffmann, Milwaukee, Wis., assignor to Gossen Corporation, Milwaukee, Wis.

Filed Dec. 28, 1984, Ser. No. 687,058

Int. Cl.[4] B37B *5/18, 5/14;* **B29C** *67/22, 47/02*

U.S. Cl. 428—318.6 **7 Claims**



1. An integral composite profile of a cellular thermoplastic resin and a non-cellular thermoplastic resin in which a first profile has a tongue and a second profile has a pair of fingers which encapsulate and are fused to the tongue of the first profile.

4,690,863

MAGNETIC RECORDING MEDIA AND PROCESS FOR PRODUCING SAME

Takahito Miyoshi, Odawara; Masaaki Fujiyama, Minamiashigara; Akihiro Matsufuji, and Nobuyuki Yamamoto, both of Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1985, Ser. No. 744,567

Claims priority, application Japan, Jun. 21, 1984, 59-126349

Int. Cl.[4] G11B *5/714*

U.S. Cl. 428—328 10 Claims

1. A magnetic recording medium comprising a nonmagnetic supporting substrate and a ferromagnetic alloy powder-containing magnetic layer applied onto the surface thereof with a binder, characterized in that said ferromagnetic alloy powder to be used has a specific surface area (S_{BET}) of no less than 45 m^2/g and an absorbed water content of no higher than 1.2% by weight.

4,690,864

MAGNETIC RECORDING MEDIUM

Masaya Funahashi, Osaka; Teruhisa Miyata, Kyoto; Kenichi Inoue, Muko; Akira Miyake, Kyoto, and Kohji Norimatsu, Fukuchiyama, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Oct. 15, 1986, Ser. No. 919,021

Claims priority, application Japan, Oct. 15, 1985, 60-230574

Int. Cl.[4] G11B *5/71*

U.S. Cl. 428—336 9 Claims

1. A magnetic recording disc which comprises a non-magnetic support and a magnetic layer provided on at least one surface of said support, said magnetic layer comprising magnetic powder, a resinous binder, (a) an ester of an unsaturated fatty acid of 8 to 18 carbon atoms with a monovalent or polyvalent, saturated or unsaturated alcohol of not more than 18 carbon atoms optionally substituted with at least one alkoxy group having not more than 8 carbon atoms and (b) a fatty acid ester of the formula:

$$R_1-\overset{\overset{O}{\|}}{C}-O+CH_2CH_2O)_{\overline{n}}R_2$$

wherein R_1 is a saturated or unsaturated aliphatic hydrocarbon group having 8 to 18 carbon atoms, R_2 is an alkyl group having not more than 18 carbon atoms and n is an integer of 1 or more, the combined amount of the unsaturated fatty acid ester (a) and the fatty acid ester (b) being not less than 5 parts by weight to 100 parts by weight of the magnetic powder.

4,690,865

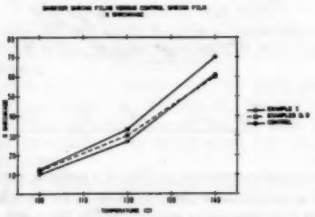
HEAT-SHRINKABLE POLYMERIC BARRIER FILM

Dan S. C. Fong, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 839,921, Mar. 17, 1986, abandoned. This application Apr. 28, 1986, Ser. No. 859,204

Int. Cl.[4] B32B *27/08, 27/30;* B05D *3/12;* B65B *51/10*

U.S. Cl. 428—341 8 Claims



1. A heat-shrinkable barrier film consisting essentially of an oriented, shrinkable polyolefin film coated on at least one side with a vinylidene chloride copolymer which film is capable of shrinking at least 10% in either the machine or transverse directions, or both.

4,690,866

POLYESTER FIBER

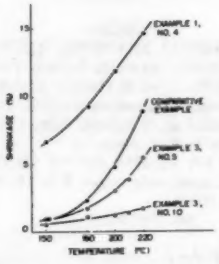
Shiro Kumakawa, and Kazuyuki Yamamoto, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 3, 1985, Ser. No. 751,796

Claims priority, application Japan, Jul. 9, 1984, 59-140655; Aug. 2, 1984, 59-161623; Nov. 29, 1984, 59-250552

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—364 8 Claims



1. A polyester fiber composed of a polyester comprising ehtylene terephthalate units as the main recurring units and having an intrinsic viscosity of at least 0.90, wherein the amorphous orientation degree is in the range of from 0.30 to 0.55, wherein the peak temperature of the meain dispersion appearing in the temperature dispersion of the dynamic loss elasticity modulus is lower than 125° C., and the crystal melting point is at least 270° C.

4,690,867

MATERIAL FOR LOW MELTING POINT METAL CASTING EQUIPMENT

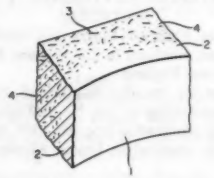
Tsutomu Yamamoto; Michio Nishiyama; Mitsuo Yamamoto, and Masakazu Ozaki, all of Yokohama, Japan, assignors to Nichias Corporation, Tokyo, Japan

Filed Mar. 31, 1986, Ser. No. 846,222

Claims priority, application Japan, Apr. 5, 1985, 60-71039; Feb. 12, 1986, 61-26854

Int. Cl.[4] B32B *13/02*

U.S. Cl. 428—367 6 Claims



1. A material for low melting point metal casting equipment comprising a calcium silicate molded body reinforced with fibers, characterized in that the matrix of said molded body substantially comprises xonotlite, that a surface of said molded body coming in contact with any molten metal to be cast and the zone near the surface substantially contain no reinforcing fibers or less reinforcing fibers than that of other zones, thereby providing that the fracture toughness of said surface or zone is lower than that of said other zones.

4,690,868

PROCESS FOR SURFACE TREATING CLAY MINERALS AND RESULTANT PRODUCTS

Camilla A. Rice, Sandersville, Ga., assignor to E.C.C. America Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 699,014, Feb. 8, 1985, abandoned. This application Nov. 20, 1986, Ser. No. 933,083
Int. Cl.[4] B32B 5/16; C23C 16/00
U.S. Cl. 428—409 12 Claims

1. A 2-dimensional layered lattice silicate having the general formula $E_iM_xSi_yO_n(OH)_m$, where M is Al, Mg, or Fe; x=2 to 6; y=2 to 8, n=2 to 20; m=0 to 8; and E_i is one or more exchangeable ions; the surface of which has been modified by surface bound NH_2 groups.

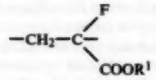
4,690,869

TRANSPARENT COATING MATERIAL

Akira Ohmori, and Kazuo Ishiwari, both of Ibaraki, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 708,446, Mar. 5, 1985, abandoned. This application Jan. 23, 1986, Ser. No. 821,519
Claims priority, application Japan, Mar. 9, 1984, 59-46183
Int. Cl.[4] C08F 20/24
U.S. Cl. 428—421 5 Claims

1. In a method of coating an article with a transparent coating material having outstanding resistance to weather and water, said article being selected from the group consisting of furniture, a machine, a building and a fixed structure, the improvement wherein said coating material comprises a polymer which contains at least 50 wt. % of a structural unit represented by the formula



(a)

wherein R^1 is fluroalkyl having 2 to 10 carbon atoms, the light transmittance of said coating material being more than 80% when a sheet of 2 mm in thickness is tested with the use of a light having a wavelength of 600 mm.

4,690,870

MAGNETIC RECORDING MEDIUM

Tsutomu Okita; Nobuo Tsuji; Hiroshi Hashimoto, and Yoshito Mukaida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 25, 1984, Ser. No. 654,290
Claims priority, application Japan, Sep. 26, 1983, 58-177827
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.[4] G11B 5/702
U.S. Cl. 428—425.9 28 Claims

1. A magnetic recording medium comprising a non-magnetic support having thereon an electron beam radiation-cured magnetic recording layer, said magnetic layer comprising ferromagnetic particles and a binder comprising

(1) a resin selected from the group consisting of a vinyl resin containing a carboxylic group in an amount of about 5×10^{-5} to 2×10^{-3} equivalent per gram and a nitrocellulose resin;

(2) an urethane resin having at least one terminal acrylate group in the main chain or in a side chain of the molecule; and

(3) a compound having at least one acryloyl group which is obtained by modifying the isocyanate group of a polyisocyanate having at least two isocyanate groups per molecule, wherein the ratio of said vinyl resin to said urethane resin is from about 20:80 to 90:10, and said compound containing at least one acryloyl group is present in an amount of from about 20 to 400 parts by weight per 100 parts of the total amount of said vinyl resin and said urethane resin.

10. A method for producing a magnetic recording medium comprising the steps of

(A) coating a magnetic recording layer on a non-magnetic support, said layer comprising ferromagnetic particles and a binder comprising

(1) a resin selected from the group consisting of a vinyl resin containing a carboxylic group in an amount of about 5×10^{-5} to 2×10^{-3} equivalent per gram and nitrocellulose resin;

(2) a urethane resin having at least one terminal acrylate group in the main chain or in a side chain of the molecule; and

(3) a compound having at least one acryloyl group which is obtained by modifying the isocyanate group of polyisocyanate having at least one isocyanate group per molecule; and

(B) curing said magnetic layer by electron beam irradiation using an accelerating voltage of from about 100 to 1000 kV and an absorption dose of from about 1 to 20 megarads, wherein the ratio of said vinyl resin to said urethane resin is from about 20:80 to 90:10, and said compound containing at least one acryloyl group is present in an amount of from about 20 to 400 parts by weight per 100 parts of the total amount of said vinyl resin and said urethane resin.

4,690,871

PROTECTIVE OVERCOAT OF TITANIUM NITRIDE FILMS

Roy G. Gordon, c/o Thompson Birch, Gauthier & Samuels 225 Franklin St., Boston, Mass. 02110

Filed Mar. 10, 1986, Ser. No. 837,774
Int. Cl.[4] C03C 17/00
U.S. Cl. 428—432 16 Claims

1. A solar screening transparent sheet product characterized by oxidation resistance even during annealing, tempering, bending or other processes at temperatures above about 800° F., said product having:

(a) an exterior film of tin oxide forming means to mechanically and chemically protect a film of titanium nitride;

(b) said film of titanium nitride under said tin oxide and forming the principal barrier to near infrared radiation of such product; and

(c) a substrate of transparent glass under said film of titanium nitride.

11. A process for making a transparent sheet product comprising a layer of titanium nitride as a means to reduce near infrared radiation from penetrating the coated glass, said process comprising the steps of:

(a) coating said glass with an effective thickness of titanium nitride forming means to reduce passage of said near infrared radiation; and

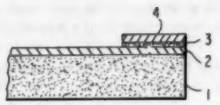
(b) thereupon overcoating said titanium nitride with a coating from 300 to 800 angstroms of tin oxide.

4,690,872

CERAMIC HEATER

Norio Kato; Shunkichi Nozaki; Yukihiro Kimura, and Rokuro Kambe, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Japan

Continuation of Ser. No. 661,880, Oct. 17, 1984, abandoned, which is a continuation of Ser. No. 510,138, Jul. 1, 1983, abandoned. This application Jun. 16, 1986, Ser. No. 876,643
Claims priority, application Japan, Jul. 7, 1982, 57-116809
Int. Cl.[4] B32G *9/04;* H05G *3/10*
U.S. Cl. 428—446 8 Claims



1. A ceramic heater comprising an alumina or silicon nitride ceramic substrate of high mechanical strength and an electrode through which current is applied attached thereto, wherein said ceramic substrate has formed thereon, by deposition, an electrically conductive layer consisting essentially of a silicide of an element selected from groups IVb, Vb and VIb of the Periodic Table.

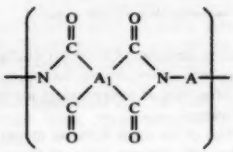
4,690,873

GAS SEPARATING MATERIAL

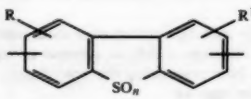
Hiroshi Makino, and Masayuki Nakatani, both of Ichihara, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Nov. 22, 1985, Ser. No. 800,981
Claims priority, application Japan, Nov. 30, 1984, 59-251613
Int. Cl.[4] B32B *27/00, 27/02;* B01D *53/22*
U.S. Cl. 428—473.5 8 Claims

1. A gas separating material having a gas separating layer comprising at least one aromatic imide polymer which contains at least 20 molar % of at least one type of recurring unit of the formula (I):



wherein A_1 represents a tetravalent aromatic radical and A represents a divalent aromatic radical of the formula (II):



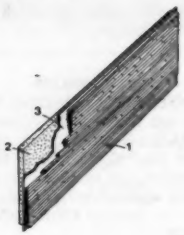
in which R and R^1 respectively represent independently from each other a member selected from the group consisting of a hydrogen atom and organic and organic radicals, and n represents zero or an integer of 1 to 2.

4,690,874

MOLDED CONSTRUCTION ELEMENT

Claude Sauer, Aix-en-Provence; Raymond Burger, Sainte-Marie-Au; Gabriel Reguigne, Blois, and Mark Kern, Paris, all of France, assignors to Tourisme Hotellerie Ltd., Chypre, Switzerland

Filed Oct. 30, 1985, Ser. No. 793,114
Claims priority, application France, Apr. 25, 1984, 84 006507; May 4, 1984, 84 07004; May 4, 1984, 84 07005
Int. Cl.[4] B32B *21/04;* B24D *3/02*
U.S. Cl. 428—537.1 2 Claims



1. A process of forming an external and internal structural building component comprising:

selecting a supply of Phragmites Communis reeds, placing said supply of siad reeds inside a rotating drum to roll said reeds over one another for stripping the leaves from said reeds to obtain a plurality of reed stems, and scoring the epidermis of said reed stems within said drum by rotating said reed stems in contact with siliceous particles of the leaves that are stripped from said reeds;

forming a first layer having opposite sides of said plurality of reed stems that have a second epidermis;

providing an intermediate layer of said building component having opposite sides including a sheet of fluid-tight material;

providing a third layer of said building component from a supply of reed particles, said reed particles being processed from 20 to 50 percent Phragmites Communis reed stems and 50 to 80 percent of reed stems of another variety of reeds having a softer epidermis than the epidermis of said Phragmites Communis reeds; and

bonding said first layer of reed stems to one of said sides of said intermediate layer and to one another such that one of said sides of said first layer is exposed with said reed stems facing outwardly and the other of said sides of said first layer is adjacent said intermediate layer with a glud consisting of an isocyanate base, and bonding said reed particles of said third layer together and to the other of said sides of said intermediate layer with a glue consisting of an isocyanate base.

2. A structural component product made according to the process of claim 1.

4,690,875

HIGH VACUUM CAST INGOTS

Charles d'A. Hunt, deceased, late of Petaluma, Calif. (by Barbara A. Hunt, executrix), assignor to Degussa Electronics Inc., Materials Division, Morgan Hill, Calif.

Continuation-in-part of Ser. No. 747,332, Jun. 21, 1985, abandoned, which is a continuation-in-part of Ser. No. 570,176, Jan. 12, 1984, Pat. No. 4,558,729. This application Jul. 2, 1986, Ser. No. 881,218
Int. Cl.[4] B22D *25/06*
U.S. Cl. 428—577 15 Claims

1. A vacuum cast high strength iron, nickel or cobalt based alloy ingot wherein the average as cast diameter of the grains when viewed on a surface cut perpendicular to the longitudinal axis of the ingot is between about 50 μm and about 500 μm, and

wherein the average as cast diameter of the grains when viewed on a surface cut parallel to the longitudinal axis of the ingot is at least equal to the said perpendicular diameter,

said ingot being further characterized by a subgranular structure of substantially equiaxed cells having an average as cast diameter of between about 20 μm and about 80 μm,

said ingot having a density greater than 99.5% of theoretical density of the alloy in the as-cast condition, and having less than five ppm total oxygen content and less than one ppm oxygen as insoluble oxide.

4,690,876

ARTICLE COMPRISING A DUCTILE BRAZING ALLOY FOIL CONTAINING REACTIVE METALS AND PRECIOUS METALS

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 672,058, Nov. 16, 1984, Pat. No. 4,606,978, which is a continuation of Ser. No. 422,625, Sep. 24, 1982, abandoned. This application Feb. 20, 1986, Ser. No. 831,216

The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.[4] C22C *30/02, 5/00*

U.S. Cl. 428—606 **6 Claims**

1. An article consisting essentially of a ductile brazing alloy foil said alloy having a liquidus temperature of from 890° C. to 1400° C. a composition consisting essentially of from about 0.25% to about 5% by weight of a reactive metal selected from the group consisting of vanadium, zirconium and mixtures thereof, from about 25% to about 85% by weight of gold and from about 3% to about 40% by weight of nickel and from about 5% to about 65% by weight of copper.

4,690,877

ELECTROCHEMICAL CELL HAVING A NON-AQUEOUS ELECTROLYTE

Jean-Paul Gabano, Poitiers; Michel Broussely, Ligugé; Jean-Pierre Pereira-Ramos, Creteil; Richard Messina, Boussy Saint Antoine, and Jacques Perichon, Savigny sur Orge, all of France, assignors to Saft, S.A., Romainville, France

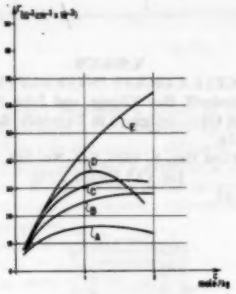
Filed Jan. 21, 1986, Ser. No. 821,157

Claims priority, application France, Jan. 30, 1985, 8501309

Int. Cl.[4] H01M *6/14*

U.S. Cl. 429—194 **3 Claims**

1. An electrochemical cell having a negative active material, a positive active material, and a non-aqueous electrolyte, the cell being capable of operation in a temperature range between 100° C. and 200° C., wherein the negative active material is selected from the group consisting of alkali metals, alkaline earths, magnesium, and aluminum, the positive active material is selected from the group consisting of CuO, $Cu_4O(PO_4)_2$, CF_x, MnO_2, V_2O_5, MoS_3, TiS_2, V_2S_5, V_6O_{13}, MoS_2, and $NiPS_3$, and wherein said nonaqueous electrolyte consists of at least one solvent selected from the group consisting of dimethylsulfone alone and mixtures of dimethylsulfone with other aromatic or aliphatic linear sulfones.



4,690,878

BATTERY POWER DETECTOR FOR SENSING PRESENCE OF BATTERIES

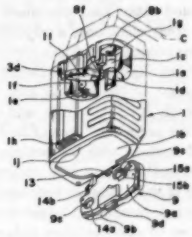
Ikushi Nakamura, Sakai, Japan, assignor to Minolta Camera Kabukishi Kaisha, Japan

Filed Aug. 15, 1986, Ser. No. 897,101

Claims priority, application Japan, Aug. 23, 1985, 60-129357[U]; Feb. 12, 1986, 61-29400

Int. Cl.[4] H01M *2/10*

U.S. Cl. 429—1 **3 Claims**



1. A power supply for use in an electronic apparatus comprising:

a battery housing for accommodating a set of cylindrically-shaped batteries in parallel-spaced relationship with each other,

a battery door connected to the battery housing by a hinge to expose an opening of the housing and to close the opening to axially depress the batteries, and some of said batteries being located in the battery housing at one position relatively close to the hinge and the remainder of the batteries being located at another position relatively remote from the hinge;

a first contact means mounted on a bottom of the battery housing to be in contact with terminals of the batteries,

a second contact means mounted on the battery door to be in contact with terminals of the batteries and to connect the batteries in series in association with the first contact means,

a detector mounted on the bottom of the battery housing to operate when at least one battery located at the position remote from the hinge is depressed due to the battery door closing operation and the batteries are connected to each other in series, and

a switch mounted on the bottom of the battery housing to

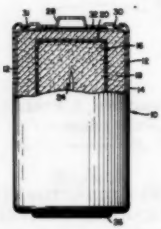
operate due to the operation of the detector for signalling said apparatus that the batteries have been connected to each other in series.

4,690,879

CELL CIRCUIT INTERRUPTER

Harry R. Huhndorff, Bay Village, and John P. Myers, Cleveland, both of Ohio, assignors to Eveready Battery Company, St. Louis, Mo.

Filed Dec. 5, 1986, Ser. No. 938,303
Int. Cl.[4] H01M 2/00
U.S. Cl. 429—61 **13 Claims**



1. A galvanic cell comprising a metal container closed at one end and including in said container a positive electrode, a negative electrode and an electrolyte with said container being in electrical contact with one of said electrodes; a cover mounted over said metal container, said cover being secured to said metal container with at least a portion of said cover being electrically insulated from said container and in electrical contact with the other electrode; a conductive member, said conductive member being secured to a portion of the bottom of said container with an electrically insulating securing means so that at least a portion of the interial area of the conductive member is electrically insulated from said container while at least a portion of the peripheral area of said conductive member is in electrical contact with the bottom of said container; and wherein electrically conductive securing means secures the peripheral area of the conductive member to, and in electrical contact with, the bottom of said container so that when the center of the bottom of said container bulges a predetermined amount, said electrically conductive securing means will break to separate the peripheral area of said conductive member from the bottom of said container thereby breaking the electrical contact between the bottom of said container and said conductive member.

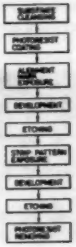
4,690,880

PATTERN FORMING METHOD

Hideyuki Suzuki, Machida; Katsunori Terada, Sagamihara; Yuichi Masaki, Kawasaki, and Kenji Morimoto, Ise, all of Japan, assignors to Canon Kabushiki Ksisha, Tokyo, Japan

Continuation of Ser. No. 755,463, Jul. 16, 1985, abandoned. This application May 5, 1986, Ser. No. 860,698
Claims priority, application Japan, Jul. 20, 1984, 59-149660; Jul. 23, 1984, 59-151382
Int. Cl.[4] G03C 5/00; G03F 9/00
U.S. Cl. 430—313 **13 Claims**

1. A method of forming a pattern on a surface of a workpiece, comprising the steps of coating the workpiece surface with photoresist, imagewise exposing, developing and etching the coated workpiece surface, said further particularly method including the steps of coating the workpiece surface with photoresist, first imagewise exposing part of the photoresist coated surface, developing the just exposed part, then imagewise exposing the unexposed portion of the coated photoresist,



developing the just exposed photoresist portion and etching the workpiece.

4,690,881

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

Kayoko Nagai, and Kazuo Tsubuko, both of Numazu, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 856,075
Claims priority, application Japan, May 13, 1985, 60-100882
Int. Cl.[4] G03G 9/12
U.S. Cl. 430—114 **8 Claims**

1. A liquid developer for electrophotography having a solid content of not less than 10% by weight and a diffusion speed (as defined in the specification) of not lower than 1 mm/min., which comprises a toner containing a coloring agent covered with a coating polymer an aliphatic hydrocarbon dispersing medium dispersing said toner therein, wherein said coloring agent comprises pigment particles coated with at least one material selected from the group consisting of humic acid, humates and humic acid derivatives, said coated pigment particles being dispersed in a resinous composition containing an ethylene-vinylacetate copolymer, and said coating polymer is a copolymer of Monomer I of the following general formula,

wherein R represents hydrogen or methyl group and A represents $-COOC_nH_{2n+1}$ or $-OCOC_nH_{2n+1}$, n being an integer of 6 to 20, and Monomer II having an allyl group.

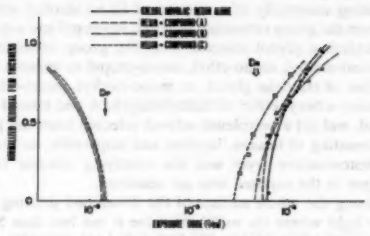
4,690,882

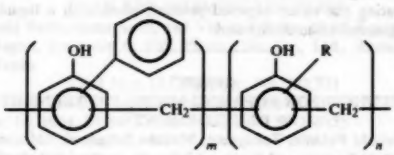
POSITIVE ACTING RESIST MATERIAL COMPRISED OF NOVOLOC RESIN DERIVED FROM PHENYLPHENOL

Katsumi Tanigaki, and Yasuo Iida, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 25, 1985, Ser. No. 780,038
Claims priority, application Japan, Sep. 28, 1984, 59-203234
Int. Cl.[4] G03C 1/52, 1/495
U.S. Cl. 430—192 **8 Claims**

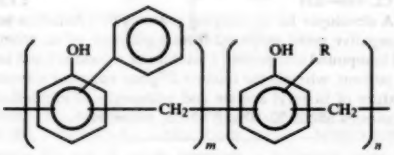
1. A positive acting resist material comprising a mixture of a novolac resin represented by the following general formula:





wherein R represents H or CH_3 and m and n are positive integers, respectively, and, a photosensitive agent which is a quinonediazide compound.

3. A positive acting resist material comprising a mixture of a novolac resin represented by the following general formula:



wherein R represents H or CH_3, and m and n are positive integers, respectively, and, a photosensitive agent which is poly(2-methylpentene-1-sulfone).

4,690,883

IMAGE FORMING PROCESS

Seiiti Kubodera, and Masaki Okazaki, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan and Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 13, 1985, Ser. No. 808,719

Claims priority, application Japan, Dec. 14, 1984, 59-264079

Int. Cl.[4] G03C *5/54, 1/14, 1/19, 1/10*

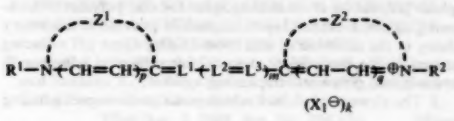
U.S. Cl. 430—203 **11 Claims**

1. A process for forming an image, comprising

imagewise exposing a photosensitive material comprising on a support a photosensitive silver halide, a sensitizing dye having general formula (I) and/or (II) as defined below, and a compound which forms or releases a mobile dye in proportion or counterproportion to the reduction of the photosensitive silver halide into silver by heating, and

transferring the resulting mobile dye to a dye-fixing element in the presence of a hydrophilic solvent as a dye transfer assistant, said hydrophilic solvent consisting essentially of water,

wherein formula (I) is:



wherein

Z^1 and Z^2 individually represent a group of non-metallic atoms necessary to form a 5- or 6-membered heterocyclic ring, Z^1 and Z^2 may be the same or different,

R^1 and R^2 individually represent a substituted or unsubstituted alkyl group, R^1 and R^2 may be the same or different,

L^1, L^2 and L^3 individually represent a substituted or unsubstituted methine group,

p and q are individually equal to 0 or 1,

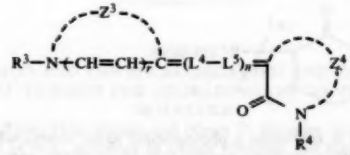
m is equal to 0, 1, 2, or 3,

$X_1^\ominus$ represents an anion,

k is equal to 0 or 1,

with the proviso that the number of organic acid groups contained in the molecular except $X_1^\ominus$ is up to 1,

and formula (II) is:



wherein

Z^3 has the same meaning as Z^1 and Z^2,

R^3 has the same meaning as R^1 and R^2 except an alkyl group having an acid group,

L^4 and L^5 have the same meaning as L^1, L^2, and L^3,

Z^4 represents a group of non-metallic atoms necessary to form a 5- or 6-membered heterocyclic ring,

R^4 represents a hydrogen atom, or a substituted or unsubstituted alkyl, aryl or heterocyclic group,

r has the same meaning as p and q, and

n has the same meaning as m, wherein the imagewise exposed photosensitive material is heated to develop the imagewise exposed photosensitive material.

4,690,884

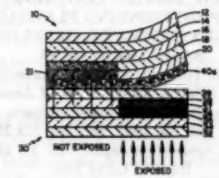
PHOTOGRAPHIC ELEMENT AND METHOD FOR FORMING TRANSPARENCIES

Frank E. DeBruyn, Jr., Abington, and Lucretia J. Weed, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 11, 1986, Ser. No. 828,385

Int. Cl.[4] G03C *5/54, 5/26, 5/36, 5/38*

U.S. Cl. 430—206 **24 Claims**



1. A scavenger-spreading element for use with a photosensitive element adapted to remove unwanted by-products produced during processing of said photosensitive element with a processing composition containing a polymeric thickening

agent, which comprises a support carrying a layer of a hydrophilic polymer, a cross-linking agent for said polymeric thickening agent, a barrier layer adapted to provide a temporary delay in the diffusion of said cross-linking agent pH reducing means, and a layer adapted to exhibit subtantial adhesion to cross-linked polymeric thickening agent.

2. The element of claim 1 which includes silver precipitating nuclei.

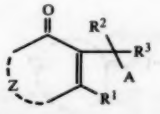
4,690,885

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Morio Yagihara, and Akihiko Ikegawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1985, Ser. No. 787,957
Claims priority, application Japan, Oct. 16, 1984, 59-216926
Int. Cl.[4] G03C *1/40, 1/06, 1/34, 1/42*
U.S. Cl. 430—212 **32 Claims**

1. A silver halide photographic material which comprises a support having coated thereon a light-sensitive silver halide emulsion layer, wherein the photographic material contains at least one blocked photographic agent represented by the following general formula (I):



(I)

wherein A represents a photographic agent moiety which is bonded to a blocking moiety through a hetero atom, or a precursor thereof; R^1 represents a member selected from the group consisting of a hydrogen atom, an alkyl group, an alkenyl group, an aryl group, an alkoxy group, an oxycarbonyl group, a carbamoyl group, an acyl group, a sulfonyl group, a sulfinyl group and a sulfamoyl group, and R^2 and R^3 each represents a hydrogen atom, or a substituent group; and Z represents atoms necessary to form a cyclopentenone ring, a cyclohexenone ring, a cycloheptenone ring, a benzocycloheptenone ring, a 4-pyridone ring, a 4-quinolone ring, a 2-pyrone ring, a 4-pyrone ring, a 1-thio-2-pyrone ring, a 1-thio-4-pyrone ring, a coumarin ring, a chromone ring or a uracil ring, provided that said uracil ring has an alkyl group on the N atom adjacent to the carbon atom to which R^1 is attached and provided that none of said rings contains an >NH group at the position adjacent to the carbon atom to which R^1 is attached.

19. A silver halide photographic material as in claim 1, wherein the blocked photographic agent is present in a silver halide emulsion layer, a coupler layer, a subbing layer, a protective layer, an interlayer, a filter layer, an antihalation layer, an image receiving layer, a cover sheet layer, or an auxiliary layer.

4,690,886

METHOD FOR MAKING NEGATIVE WORKING O-QUINONE DIAZIDE CONTAINING DRY PLANOGRAPHIC PRINTING PLATE UTILIZING MULTIPLY LIGHT EXPOSURE, DEVELOPMENT AND BASIC TREATMENT

Yasuhisa Naritomi, Haibara; Hiroshi Takahashi, Fujieda, and Keisuke Shiba, Minami-Ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Feb. 13, 1985, Ser. No. 701,289
Claims priority, application Japan, Feb. 14, 1984, 59-25489
Int. Cl.[4] G03F *7/08*
U.S. Cl. 430—303 **9 Claims**

1. A method for making a dry planographic printing plate, the steps comprising:

first, exposing a dry negative working presensitized plate comprising a base substrate having provided thereon, in order, a photosensitive layer containing an orthoquinonediazide compound and a silicone rubber layer to light through a negative transparency,

developing the exposed printing plate by a developer consisting essentially of a mixture of (i) an alcohol selected from the group consisting of ethyl, isopropyl and n-propyl alcohol, a glycol selected from the group consisting of mono-methyl, mono-ethyl, mono-propyl or mono-n-butyl ether of ethylene glycol, or mono-methyl, mono-ethyl or mono-n-butyl ether of diethylenegylcol, and benzyl alcohol, and (ii) a petroleum solvent selected from the group consisting of hexane, heptane and isoparaffin, so that the photosensitive layer and the overlying silicone rubber layer in the exposed area are removed,

exposing the whole surface of the developed printing plate to light where the exposure value is not less than 5% of the exposure value at the time of the exposure to light through the negative transparency, and

treating the twice exposed printing plate with a liquid or gaseous basic compound.

4,690,887

METHOD FOR FORMING MICRO-PATTERNS BY DEVELOPMENT

Mitsutoshi Fukuda, Tokuyama; Makoto Fukutomi, Shinnanyo; Osamu Kogure, and Kazunori Miyoshi, both of Tokai, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Shinnanyo and Toyo Soda Manufacturing Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 489,344, Apr. 28, 1983, abandoned.
This application Nov. 22, 1985, Ser. No. 800,100
Claims priority, application Japan, Apr. 28, 1982, 57-70482
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—331 **1 Claim**

1. A developer for developing patterns of a radiation sensitive negative resist prepared from a polymer of an aromatic vinyl compound comprising a mixture of a good solvent and a poor solvent, wherein the mixture of good and poor solvents is a mixture of isoamyl acetate and ethleneglycol ethylether in the ratios of about 50/50 and 45/55, respectively.

4,690,888

SILVER HALIDE COLOR PHOTO-SENSITIVE MATERIAL

Mitsuto Fujiwhara; Takao Nimura; Yasumasa Numata, and Yasuko Matsubara, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,340
Claims priority, application Japan, Sep. 14, 1984, 59-195152
Int. Cl.[4] G03C *1/40, 7/32*
U.S. Cl. 430—549 **10 Claims**

1. In a photo-sensitive silver halide color photographic material having both (1) ballasted couplers combined with photo-sensitive silver halide emulsions and (2) colored compounds capable of reacting with the oxidized developing agent; said photo-sensitive silver halide color photographic material characterized in that (a) said colored compounds are compounds capable of diffusing at least 1μm in said photographic material during developing treatments thereof, (b) said colored compounds have their main absorption in the main absorption wavelength region of a dye produced by the reaction of said ballasted coupler with the oxidized color developing agent; (c) said colored compounds are contained either in the silver halide emulsion layers containing said ballasted couplers which produce said colored compounds, or in the silver halide emulsion layers having spectral sensitivity similar to said emulsion layers containing said ballasted couplers which produce said colored compounds, or in a photo-insensitive layer adjacent to said silver halide emulsion layers containing said ballasted couplers which produce said colored compounds; (d) said colored compounds are made colorless or diffused out from the photographic material by reaction with the oxidized color developing agent; and (e) said colored compounds are

capable of remaining in the photographic material even after the developing treatments in an amount of at least 30% by weight of the amount added.

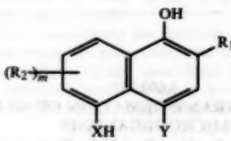
4,690,889

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING NOVEL CYAN DYE FORMING COUPLER

Naoki Saito; Kozo Aoki, and Yukio Yokota, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 10, 1985, Ser. No. 732,771
Claims priority, application Japan, May 10, 1984, 59-93605; Dec. 14, 1984, 59-264277; Dec. 19, 1984, 59-268135
Int. Cl.[4] G03C *1/40, 1/08, 7/32*
U.S. Cl. 430—552 20 Claims

1. A silver halide color photographic light-sensitive material containing a cyan dye forming coupler represented by formula (I):



(I)

wherein R_1 represents —$CONR_3R_4$, —$NHCOR_3$, —$NHCOOR_5$, —$NHSO_2R_5$, —$NHCONR_3R_4$ or —$NHSO_2NR_3R_4$, wherein R_3 and R_4 each represent a hydrogen atom or a straight or branched chain or cyclic substituted or unsubstituted alkyl, alkenyl, or alkynyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted monocyclic or condensed heterocyclic ring, and R_5 represents a straight or branched chain or cyclic substituted or unsubstituted alkyl, alkenyl, or alkynyl group, a substituted or unsubstituted aryl group including a condensed ring, or a substituted or unsubstituted monocyclic or condensed heterocyclic ring; R_2 represents a group capable of substituting for a hydrogen atom on the naphthol ring; m represents 0 or an integer of from 1 to 3; X represents an oxygen atom, a sulfur atom, or

wherein R_6 represents a hydrogen atom or a monovalent organic group; and Y represents a hydrogen atom or a group capable of being released in a coupling reaction with an oxidation product of an aromatic primary amine developing agent; when m is 2 or 3, the plural R_2 groups can be the same or different, or together form a ring; or R_2 and X, X and Y, or R_3 and R_4 together form a ring; or formula (I) represents a dimer or a higher polymer by bonding at R_1, R_2, X or Y, wherein the hydrogen atom of OH, SH or R_6N as —XH undergoes intramolecular hydrogen bond formation after the coupling reaction with the oxidation product of the aromatic primary amine developing agent and thus stabilizes the cyan dye images to heat and light.

4,690,890

PROCESS FOR SIMULTANEOUSLY DETECTING MULTIPLE ANTIGENS USING DUAL SANDWICH IMMUNOMETRIC ASSAY

Rueyming Loor, Hercules; Thabiso M'Timkulu, El Sobrante, and Susanne K. DeWitt, Berkeley, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Apr. 4, 1984, Ser. No. 596,676
Int. Cl.[4] G01N *33/53, 33/545;* C12Q *1/42;* C12N *15/00*
U.S. Cl. 435—7 17 Claims

1. An immunometric assay for detecting the presence of prostatic acid phosphatase and prostate antigen in a sample which comprises contacting the sample with (a) a labeled monoclonal antibody from hybridoma cell line ATCC No. HB 8523, which is directed against prostatic acid phosphatase, (b) a labeled monoclonal antibody from hybridoma cell line ATCC No. HB 8525, which is directed against prostate antigen, (c) an immobilized monoclonal antibody from hybridoma cell line ATCC No. HB 8526 or HB 8523, directed against prostatic acid phosphatase, and (d) an immobilized monoclonal antibody from hybridoma cell line ATCC No. HB 8527, directed against prostate antigen, wherein each immobilized antibody is immobilized on a common support.

4,690,891

METHOD AND THE MICROORGANISM AND ENZYME USED THEREIN FOR DEGRADING THE XANTHAN MOLECULE

Ching-Tsang Hou, Edison, and Nancy P. Barnabe, Annandale, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 11, 1985, Ser. No. 774,971
Int. Cl.[4] C12P *39/00;* C12N *9/42, 1/20;* C12R *1/07*
U.S. Cl. 435—42 6 Claims

1. A method for degrading xanthan molecule comprising contacting said xanthan molecule with a mixed culture bearing the ARS Culture Collection Accession No. NRRL B-15992, wherein the contacting is conducted under aerobic conditions suitable for the growth of said first soil bacterium and for the elaboration of xanthan-degrading enzymes by said first soil bacterium, wherein said xanthan-degrading enzymes include a xanthan depolymerase which breaks the endo β-1,4-glucosidic linkage of said xanthan molecule.

4,690,892

PROCESS FOR THE RECYCLE OF PHASE-FORMING LIQUIDS OF MULTI-PHASE AQUEOUS SYSTEMS

Kavssery P. Ananthapadmanabhan, Spring Valley, N.Y., and Errol D. Goodard, Haworth, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 728,242, Apr. 29, 1985, abandoned. This application Feb. 12, 1986, Ser. No. 828,656
Int. Cl.[4] C12N *9/00, 9/28, 9/20, 9/42;* C07K *3/12, 3/28*
U.S. Cl. 435—183 19 Claims

1. A method for recycling the phase-forming liquids of an aqueous system having at least two aqueous phases and which contains biological material in at least one phase thereof, comprising:

a. introducing into at least one of said liquid phases containing biological material a water-insoluble, particulate, inert inorganic binder under conditions suitable for the formation of a biological material/binder composition;

b. recovering the biological material/binder composition from said liquid phase, and

c. recycling at least a portion of the liquid phase from which biological material has been recovered to the two phase system.

4,690,893

HYBRIDOMA CELL LINES PRODUCING MONOCLONAL ANTIBODIES WHICH SPECIFICALLY BIND TO MOUSE INTERLEUKIN-2

Tim R. Mosmann, Atherton, Calif., assignor to DNAX Research Institute of Molecular and Cellular Biology, Inc., Palo Alto, Calif.

Filed May 3, 1985, Ser. No. 730,308
Int. Cl.[4] C12N *5/00*; C07K *15/04*
U.S. Cl. 435—240.27 2 Claims

2. A monoclonal antibody produced by a hybridoma having the identifying characteristics of the cell line deposited under American Type Culture Collection accession number HB8794.

4,690,894

TREATMENT OF MICROORGANISMS WITH ALKALINE SOLUTION TO ENHANCE METAL UPTAKE PROPERTIES

James A. Brierley; Corale L. Brierley, both of Socorro, N. Mex.; Raymond F. Decker, Houghton, Mich., and George M. Goyak, Harmony, Pa., assignors to Advanced Mineral Technologies, Inc., Golden, Colo.

Filed Sep. 20, 1985, Ser. No. 777,061
Int. Cl.[4] C12N *1/38, 1/14, 1/06*; C02F *3/00*
U.S. Cl. 435—244 20 Claims

1. A process for enhancing the metal uptake properties of *Bacillus subtilis* from aqueous solutions containing metal cations, which comprises,

treating cells of said *Bacillus subtilis* characterized by cell walls with an amount of a caustic solution maintained at an elevated temperature above ambient and ranging up to boiling at a pH in excess of 9 sufficient to form a causticized biomass reaction product consisting essentially of material derived from the cell walls thereof having enhanced metal uptake properties,

and thereafter recovering, washing to remove excess caustic and drying said treated biomass to form a relatively solid, stable product thereof,

said causticized biomass reaction product in the particulate state being characterized by alkalinity when dispersed in water and also being characterized by substantially enhanced metal uptake as compared to the metal uptake of *Bacillus subtilis* in the untreated state.

4,690,895

USE OF RLDM TM 1-6 AND OTHER LIGNINOLYTIC ENZYMES IN THE BLEACHING OF KRAFT PULP

Roberta L. Farrell, Danvers, Mass., assignor to Repligen Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 755,243, Jul. 15, 1985, abandoned. This application Mar. 28, 1986, Ser. No. 845,654
Int. Cl.[4] D21C *3/00, 3/20*; C12R *1/645*
U.S. Cl. 435—278 19 Claims

1. A process for bleaching kraft pulp which comprises treating said kraft pulp with extracellular growth medium from a fermentation of phanerochaete chrysosporium consisting essentially of rLDM TM 1 through 6, and other ligninolytic enzymes.

4,690,896

DEVICE FOR THE DETERMINATION OF MICRO-ORGANISMS

Gerhard Brüsewitz, Bergisch-Gladbach, and Reinhard Sieck, Cologne, both of Fed. Rep. of Germany, assignors to Madaus & Co., Cologne, Fed. Rep. of Germany

Filed Jan. 30, 1985, Ser. No. 696,533
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1984, 3411072; Sep. 22, 1984, 3434851
Int. Cl.[4] C12M *1/30*
U.S. Cl. 435—296 2 Claims

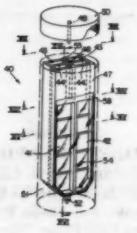
1. A device for the determination of micro-organisms, comprising:

a vessel closable with a cover;

a cover for closing said vessel;

a nutrient medium carrier housed in said vessel and comprising a longitudinal carrier body which has a plurality of troughs for the reception of nutrient substrate substances;

removable cover means on said troughs;



one or more closable filler connections, formed on said carrier body, communicating with at least one trough, and

all said troughs continuing up to said filler connections of said carrier body, said filler connections being partially formed by a common encompassing wall which follows the cross-sectional shape of said carrier body.

4,690,897

METHOD FOR TRANSFORMATION OF ANAEROBIC MICROORGANISMS

Charles H. Squires, Boulder; Donald L. Heefner, Arvada; Ronald J. Evans, Boulder; Beatrice J. Kopp, Boulder, and Michael J. Yarus, Boulder, all of Colo., assignors to Synergen Associates, Inc., Boulder, Colo.

Filed Sep. 26, 1983, Ser. No. 535,933
Int. Cl.[4] C12N *15/00, 1/00*; C12P *21/00*; C12R *1/145*
U.S. Cl. 435—320 8 Claims

1. The plasmid vector pCP1.

4,690,898

DNA CODING FOR A SIGNAL PEPTIDE AND DNA CONTAINING THE SAME

Kunio Yamane, 614-201, Takezono 3-chome, Sakura-mura, Niihari-gun, Ibaragi-ken; Kazutaka Ohmura, Chiba; Hisato Yamazaki, Hyogo, and Teruaki Shiroza, Chiba, all of Japan, assignors to Kunio Yamane, Ibaragi; The Calpis Food Industry Co., Ltd., Tokyo; Daicel Chemical Industries, Ltd., Osaka and Oji Corn Starch Co., Ltd., Tokyo, all of, Japan

Filed Feb. 25, 1985, Ser. No. 704,885
Claims priority, application Japan, Mar. 9, 1984, 59-043826
Int. Cl.[4] C12N *1/00, 15/00*; C07H *17/00*
U.S. Cl. 435—320 6 Claims

1. Essentially pure DNA consisting essentially of a sequence of DNA bases coding for the signal amino acid sequence:

Met	Phe	Ala	Lys	Arg	Phe	Lys
Thr	Ser	Leu	Leu	Pro	Leu	Phe
Ala	Gly	Phe	Leu	Leu	Leu	Phe
Tyr	Leu	Val	Leu	Ala	Gly	Pro
Ala	Ala	Ala.				

4,690,899

PROCESS AND DEVICE FOR CARRYING OUT ANALYTICAL DETERMINATIONS

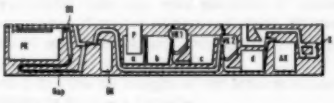
Sigmar Klose, Berg; Manfred Pasch, Tutzing; Helmut Schlumberger, Polling; Wolfgang Kleemann, Tutzing, and Friedhelm Vieth, Haunshofen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 2, 1985, Ser. No. 751,368

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3425008

Int. Cl.[4] G01N *21/07, 21/11*

U.S. Cl. 436—45 **8 Claims**



1. In a process for carrying out an analytical determination by mixing and incubating a sample liquid with at least one dry reagent soluble therein to form a reaction mixture liquid and measuring a parameter in the reaction mixture liquid, the improvement comprising:

transporting a sample liquid along a first transport path to a dry reagent positioned in said first transport path and which is soluble in said sample liquid for at least partially dissolving of the latter in the sample liquid to form a reaction mixture liquid;

then further transporting the reaction mixture liquid along the first transport path under the influence of a force-change cycle in which centrifugal force and a further force alternately predominate to determine the direction of the further transporting along the first transport path; and

transporting at least one further liquid along a second path, an initial part of which is separate from and a downstream part of which is common with the first transport path, by the force-change cycle simultaneously with the further transporting of the reaction mixture liquid in such a manner that at least the reaction mixture liquid and one of said further liquids pass through the common part of the transport path chronologically separated.

4,690,900

PROCEDURE FOR PHOTOMETRIC MEASUREMENT OF LIQUIDS IN REACTION VESSELS, AND REACTION VESSEL

Käyhkö Kimmo, and Kari H. Helenius, both of Espoo, Finland, assignors to Kone Oy, Helsinki, Finland

Filed Jan. 28, 1983, Ser. No. 462,046

Claims priority, application France, Feb. 5, 1982, 820372

Int. Cl.[4] G01N *21/03*

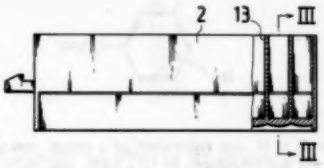
U.S. Cl. 436—47 **8 Claims**

1. A procedure for photometric measurement of liquids contained in reaction vessels in an automatic analyzer by utilizing a radiation flow along a path substantially perpendicular to a row of the reaction vessels, comprising:

filling each reaction vessel in a row of vessels with liquid to be photometrically measured, each vessel being contiguous with an adjacent vessel and separated by a common wall so as to form a unitary cuvette;

continuously moving the cuvette and contained liquid past a radiation flux source and a photometric detector measuring unit by engaging a mating member provided at one end of the cuvette with an engagement member in an automatic analyzer capable of moving the cuvette continuously in a longitudinal direction, wherein the reaction vessels are each in continuous movement relative to the photometric detector; and

passing the radiation flow continuously through side walls of each reaction vessel and the liquid contained therein and continuously photometrically measuring the contained liquid and also measuring the distance between adjacent reaction vessels, and determining a mean value of the radiation response from signals generated by the photometric measuring unit, so that the mean value of the radiation response is measured over substantially the entire length of each reaction vessel of the cuvette.



4. A row of reaction vessels for continuous photometric measurement of liquids, each reaction vessel in the row being contiguous with an adjacent vessel and separated by a common wall so as to form a unitary cuvette, wherein opposite sides of each reaction vessel are flat for receiving a continuous radiation flow from a radiation source, and the bottom of each reaction vessel of the cuvette comprises a lens, said lens having a convex shaped radius on its lower side for directing luminescent radiation from a liquid in the vessel; and at least one end of the cuvette being provided with a mating member adapted for being engaged with an engagement member for use in moving the cuvette continuously past a radiation source by means of the engagement member.

4,690,901

SILVER METHENAMINE STAINING METHOD

Beverly L. Giammara, and Jacob S. Hanker, both of Chapel Hill, N.C., assignors to The University of North Carolina at Chapel Hill, Chapel Hill and Microelectronics Center of North Carolina, Research Triangle Park, both of, N.C.

Filed Jan. 26, 1984, Ser. No. 574,108

Int. Cl.[4] G01N *21/75, 33/52*

U.S. Cl. 436—86 **9 Claims**

1. A procedure for staining a biological specimen comprising the steps of

(a) contacting a biological specimen with a solution containing periodic acid or hydrochloric acid;

(b) contacting the specimen of step (a) with a solution containing thiocarbohydrazide or thiosemicarbazide; and

(c) contacting the specimen of the step (b) with a solution of silver methenamine resulting in a stained specimen wherein silver methenamine is synthesized by mixing aqueous solutions containing silver nitrate and methenamine, filtering a resulting silver methenamine precipitate solid and air drying said solid.

4,690,902

METHOD, REAGENT AND KIT FOR THE DETERMINATION OF NITRATE IONS

Roland Bitsch, Pfungstadt, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

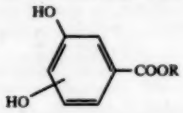
Filed Feb. 15, 1985, Ser. No. 702,154

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1984, 3405912

Int. Cl.[4] G01N *31/22*

U.S. Cl. 436—110 15 Claims

1. A method for the colorimetric determination of nitrate ions comprising admixing a sample with concentrated sulfuric acid and a color-generating compound having the formula



wherein R is H, one equivalent of a cation compatible with nitrate ion determination, or C_{1-6} alkyl, said color-generating compound being present in an amount effective to produce a quantitative coloration obtaining a resultant admixture and correlating the color of the resultant admixture with a calibrated reference standard.

4,690,903

PROCESS FOR PREPARING ORGANIC FUELS AND CHEMICALS FROM BIOMASS

Nai Y. Chen, Titusville, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 720,669, Apr. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 546,331, Oct. 28, 1983, Pat. No. 4,515,892, which is a continuation of Ser. No. 230,461, Feb. 2, 1981, Pat. No. 4,420,561. This application Jun. 2, 1986, Ser. No. 870,660

The portion of the term of this patent subsequent to Dec. 13, 2000, has been disclaimed.

Int. Cl.[4] C12P *7/06*

U.S. Cl. 435—161 15 Claims

1. An integrated process for converting fermentable sugar in aqueous solution to gasoline boiling range products which comprises:

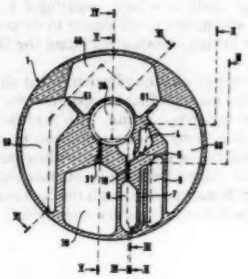
(a) converting fermentable sugar present in an aqueous solution thereof under the action of an ethanol producing microorganism to provide a dilute aqueous solution of ethanol with the ethanol being present in the solution at a concentration which does not exceed a predetermined maximum level, said predetermined maximum level of ethanol being selected to be that which is below the level of ethanol causing fermentation to substantially cease;

(b) selectively sorbing in a sorption zone, ethanol present in the solution, within a crystalline aluminosilicate zeolite characterized by a silica to alumina ratio greater than 12 and a constraint index within the range of 1 to 12, to yield an ethanol-containing zeolite,

(c) exposing the resulting ethanol-containing zeolite to ethanol conversion conditions including temperatures ranging from about 316 to 538° C., pressures ranging from about 10.13 to 1013 kPa and a liquid hourly space velocity ranging from about 0.1 to 10.

4,690,904

Patent Not Issued For This Number



4,690,905

METHOD FOR REMOVAL OF HUMAN ANTIBODIES TO NATIVE DNA FROM SERUM

Betty A. Diamond, New York, N.Y., assignor to Albert Einstein College of Medicine of Yeshiva University, a division of Yeshiva University, Bronx, N.Y.

Continuation-in-part of Ser. No. 552,290, Nov. 16, 1983, which is a continuation-in-part of Ser. No. 446,718, Dec. 3, 1982, abandoned. This application Nov. 30, 1983, Ser. No. 556,588

Int. Cl.[4] G01N *33/564, 33/577*

U.S. Cl. 436—508 9 Claims

3. A method for removing human anti-native DNA antibody from a liquid sample comprising coupling monoclonal, anti-idiotypic antibodies capable of binding to a shared idiotype on human anti-native DNA antibody to a medium, said idiotype shared between genetically nonidentical individuals, contacting a liquid sample to said medium to permit binding of human anti-native DNA antibody in said sample to said anti-idiotypic antibodies and separating said sample from said medium to remove the human anti-native DNA antibodies therefrom.

9. A method as in claim 3 in which said monoclonal, anti-idiotypic antibodies are secreted by the hybridoma deposited at the American Type Culture Collection and catalogued as ATCC #HB 8376.

4,690,906

NEPHELOMETRIC DETERMINATION OF HB, ANTIGEN WITH ANTIBODY-CONTAINING MICROPARTICLES

Jean Dubeille, Saint-Max; Bernard Pau, and Pierre Gros, both of Montpellier, all of France, assignors to Sanofi, Paris, France

Division of Ser. No. 522,533, Aug. 12, 1983, abandoned. This application Jan. 30, 1985, Ser. No. 696,474

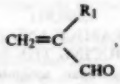
Claims priority, application France, Aug. 16, 1982, 82 14170

Int. Cl.[4] G01N 33/546, 33/547, 33/576

U.S. Cl. 436—512 13 Claims

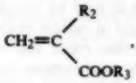
1. A method for nephelometrically determining HB_s antigen by contacting HB_s antigen with antibody containing polyfunctional hydrophilic spherical microparticles of uniform size having an average diameter of between about 10 nanometers and about 10 micrometers, said microparticles comprise copolymers obtained by copolymerizing:

(a) from 5 to 90% by weight of the total monomers of an acrylic aldehyde having a formula



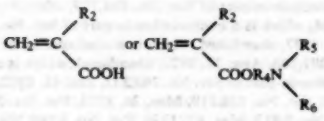
in which R_1 ia an alkyl radical having from 1 to 4 carbon atoms,

(b) from 5 to 90% by weight of total monomers of an acrylic acid derivative having a formula



in which R_2 is hydrogen or an alkyl group having from 1 to 4 carbon atoms and R_3 is a lower hydroxyalkyl radical,

(c) and less than 15% by weight of total monomers of at least one acrylic acid derivative having a formula:



wherein R_2 is hydrogen or lower alkyl and R_4, R_5 and R_6, which may be the same or different, represent a C_{1-4} alkyl group; and from 0.1 to 10% by weight of total monomers of an unconjugated diene crosslinking agent; said microparticles having coupled thereto an antibody selected from the group consisting of polyclonal antibodies isolated from specific immune sera obtained from animals after immunization with purified HB_s antigen and monoclonal antibodies produced from hybrid cells resulting from the fusion of plasmocytes of animals immunized against HB_s antigen, and from myeloma cells to obtain an antigen-antibody reaction which is nephelometrically measured.

4,690,907

CAPILLARY TUBE IMMUNOASSAY

Mitsugu Hibino; Taira Kanada, and Miyoshi Hirata, all of Tokyo, Japan, assignors to Daiichi Pure Chemicals Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1984, Ser. No. 683,628

Claims priority, application Japan, Dec. 19, 1983, 58-239549; May 8, 1984, 59-91379

Int. Cl.[4] G01N 33/558, 33/557, 33/543, 33/551

U.S. Cl. 436—514 5 Claims

1. An immunoassay for detecting the presence of a target substance in a sample by immunoreaction, which comprises:

(1) providing a capillary tube, wherein said capillary tube contains therein at least (a) a first solid matrix containing a labelled first antibody or antigen capable of binding to said target substance, and (b) a second solid matrix having immobilized thereon a second antibody or antigen capable of binding said target substance,

(2) contacting the end of said capillary tube closest to said first solid matrix with a liquid sample suspected of containing said targe substance to be measured, and allowing said sample material to migrate in said capillary tube by capillary action, thereby subjecting any target substance present in said liquid sample to immunoreaction with said first antibody or antigen in said first solid matrix to form an immunocomplex, followed by further migration of said immunocomplex and unreacted labelled first antibody or antigen into said second solid matrix, wherein any labelled immunocomplex is bound to said immobilized second antibody or antigen, and

(c) detecting the immobilized labelled immunocomplex bound to said second matrix material.

4,690,908

MEASURING REAGENT KIT FOR DETERMINING AN ANTIGEN, ANTIBODY OR ANTIGEN-ANTIBODY COMPLEX

Ei Mochida, Tokyo; Hiroyuki Shinkai, Kawagoe; Takashi Kudo, Tokyo, and Toshiyuki Sugawara, Urawa, all of Japan, assignors to Mochida Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 355,162, Mar. 5, 1982, abandoned, which is a division of Ser. No. 152,390, May 22, 1980, Pat. No. 4,332,788. This application Aug. 20, 1984, Ser. No. 642,734

Claims priority, application Japan, Jun. 5, 1979, 54-70371

Int. Cl.[4] G01N 33/546, 33/547, 33/551, 33/554

U.S. Cl. 436—518 7 Claims

1. A measuring reagent kit for an immuno-chemical agglutination reaction measurement of a quantity or concentration of a substance to be measured selected from the group consisting of an antigen, an antibody, and an antigen-antibody complex in a sample, said kit comprising:

a mercantile container, said mercantile container containing at least first, second and third individual containers;

(a) at least one said first individual container containing a reagent consisting essentially of a suspension of sensitized

carrier particles for causing agglutination by reaction with the substance to be measured, said particles being formed by binding at least one substance selected from the group consisting of antigens, antibodies, and antigen-antibody complexes to a carrier composed of insoluble finely divided particles,

(b) at least one said second individual container containing a reagent consisting essentially of a buffer solution for diluting or dissolving the sample and for maintaining a reaction mixture of said sample and said suspension at a suitable pH and ionic strength for said agglutination reaction, and

(c) at least one said third individual container containing a reagent consisting essentially of a fixing compound in a concentration sufficient for fixing agglutinates formed from the reaction between the substance to be measured and the sensitized carrier particles, wherein said kit is used for measuring the quantity or concentration of the substance to be measured in the sample by

(i) mixing an amount effective for said measurement of said sensitized carrier particles with said sample dissolved or suitably diluted with a pH stabilizing amount of said buffer solution,

(ii) adding the fixing compound in an amount effective to fix the agglutinates formed in step (i), and

(iii) measuring the absorbancy or turbidity of the reaction mixture from the above step (ii) to determine the quantity or concentration of the substance to be measured in the sample.

4,690,909

SILICON CARBIDE-GRAPHITE COMPOSITE MATERIAL AND PROCESS FOR PRODUCING SAME

Akiyasu Okuno, and Masakazu Watanabe, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Japan

Continuation of Ser. No. 558,725, Dec. 6, 1983, abandoned. This application May 6, 1986, Ser. No. 860,316

Claims priority, application Japan, Dec. 6, 1982, 57-212793

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—90 **10 Claims**

1. A process for producing a silicon carbide-graphite composite material, comprising:

adding a sintering aid to silicon carbide of an average grain size less than 1 μm, said sintering aid comprising 0.1 to 3.0 wt% of a compound selected from the group consisting of boron and a boron compound which includes a corresponding amount of boron; and 0.1 to 6.0 wt% of an organic carbonaceous compound which includes a corresponding amount of carbon each based on the weight of silicon carbide;

further adding carbon black as a silicon carbide grain growth inhibitor to silicon carbide in an amount of 1 to 20 vol% based on the volume of the silicon carbide;

blending the compositions into an intimate mixture;

molding the intimate mixture to obtain a molded body; and

sintering the molded body at about atmospheric pressure.

4,690,910

SINTERED PRODUCT OF ZIRCONIA AND METHOD OF PRODUCING THE SAME

Koji Tsukuma, and Takaaki Tsukidate, both of Shinnanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Continuation of Ser. No. 586,959, Mar. 7, 1984, abandoned. This application Dec. 2, 1985, Ser. No. 804,956

Claims priority, application Japan, Mar. 7, 1983, 58-35900

Int. Cl.[4] C04B *35/48, 35/50*

U.S. Cl. 501—103 **2 Claims**

1. A sintered product of zirconia consisting essentially of CeO_2 and ZrO_2, said product having a crystal phase consisting essentially of a tetragonal crystal phase, wherein the mole ratio of CeO_2 is 12–14 mole % and the grain size of the sintered product is at most 2 μm.

2. A sintered product of zirconia consisting essentially of CeO_2, ZrO_2 and Y_2O_3, said product having a crystal phase consisting essentially of a tetragonal phase, wherein the mole ratio of CeO_2 is 8–10 mole %, the mole ratio of Y_2O_3 is 1–2 mole %, and the grain size of the sintered product is 2 μm.

4,690,911

ZIRCONIA CERAMICS AND PROCESS FOR PRODUCING THE SAME

Takao Nakada, Hitachi, Japan, assignor to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1984, Ser. No. 662,566

Claims priority, application Japan, Oct. 20, 1983, 58-196705; Nov. 16, 1983, 58-215836

Int. Cl.[4] C04B *35/48, 35/49*

U.S. Cl. 501—105 **17 Claims**

1. A ceramic comprising a sintered body containing zirconium oxide, cerium oxide and aluminum oxide in the form of tetragonal crystals with 20% by weight or less of monoclinic and/or cubic crystals, the proportions of zirconium oxide and cerium oxide being 74 to 84% by weight of zirconium oxide and 26 to 16% by weight of cerium oxide, and the proportions of zirconium oxide-cerium oxide and aluminum ozide being 99.9 to 80% by weight of zirconium oxide-cerium oxide and 0.1 to 20% by weight of aluminum oxide.

4,690,912

RHODIUM-CONTAINING CARBONYLATION CATALYSTS WITH HALOGEN-CONTAINING PROMOTER

Frank E. Paulik, St. Louis; Arnold Hershman, Frontenac; Walter R. Knox, Town & Country, all of Mo., and James F. Roth, Allentown, Pa., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 248,777, Mar. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 824,577, Aug. 15, 1977, abandoned, which is a continuation of Ser. No. 391,103, Aug. 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 263,332, Jun. 15, 1972, Pat. No. 3,813,428, Ser. No. 128,519, Mar. 26, 1971, Pat. No. 3,769,326, and Ser. No. 2,413, Mar. 12, 1970, Pat. No. 3,769,329, which is a continuation-in-part of Ser. No. 701,637, Jan. 30, 1968, abandoned, which is a continuation-in-part of Ser. No. 628,581, Apr. 5, 1967, abandoned, said Ser. No. 263,332, is a continuation of Ser. No. 752,794, Aug. 15, 1968, abandoned, which is a continuation-in-part of Ser. No. 628,581, , said Ser. No. 128,519, is a continuation of Ser. No. 2,377, Jan. 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 628,581,. This application Oct. 14, 1983, Ser. No. 541,845

The portion of the term of this patent subsequent to May 18, 1988, has been disclaimed.

Int. Cl.[4] B01J *31/20, 31/24, 31/18, 27/08*

U.S. Cl. 502—161 **13 Claims**

1. A catalyst system for the production of carbonylation products by the reaction of a carbonylatable reactant and carbon monoxide which consists essentially of:

(a) a rhodium-containing catalytically active component, the component comprising an adduct of a rhodium-containing component source material and carbon monoxide, and

(b) a separately added iodine-containing promoter component, the promoter component being selected from the group consisting of iodine and iodide compounds,

wherein the separately added iodine atoms of (b) are in excess of the rhodium atoms in the catalyst.

2. The catalyst system of claim 1 wherein the rhodium-containing component source material is a rhodium coordination compound.

13. A catalyst system according to claim 1 wherein the rhodium-containing component source material is a rhodium trihalide and the separately added iodine-containing promoter component is methyl iodide.

4,690,913

SILVER CATALYST FOR PRODUCTION OF ETHYLENE OXIDE FROM ETHYLENE AND PROCESS FOR PRODUCING THE CATALYST

Naohiro Nojiri, Tsuchiura, and Yukio Sakai, Ami, both of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1985, Ser. No. 767,831

Claims priority, application Japan, Aug. 21, 1984, 59-173884; Sep. 14, 1984, 59-191732; Oct. 25, 1984, 59-224877

Int. Cl.[4] B01J *23/02, 23/04, 23/50*

U.S. Cl. 502—340 **8 Claims**

1. A catalyst for the production of ethylene oxide from ethylene, said catalyst comprising a porous carrier composed of a molded article of a refractory material and having thereon (i) silver grains and (ii) as a cationic component, at least one alkali metal element selected from the group consisting of lithium, sodium, potassium, rubidium and cesium, wherein

(A) silver is distributed on the outside surface of the carrier and on the inner surfaces of the pores of the carrier,

(B) silver grains distributed on the inner surfaces of the pores of the carrier have an average diameter of 0.05 to 0.2 micron,

(C) the loading (S) of silver on the outside surface layer of the catalyst and the loading (I) of silver on the innermost layer of the catalyst satisfy the following formula (1):

$$I \geqq 0.7S \quad (1)$$

in which the said outside surface layer of the catalyst denotes a portion having a weight of about 5% by weight on average, in the range of about 4–6%, shaven as uniformly as possible from the ouside surface of one catalyst particle toward its inner layer when the weight of one catalyst particle is taken as 100%, and said innermost layer of the catalyst denotes an inner layer of the catalyst particle which is left after about 60% on the average, in the range of about 50 to 70%, has been shaven off from the outside surface of the catalyst particle toward its inner layer as uniformly as possible, and

(D) the loading (Sc) of the alkali metal element as the cationic component on the outside surface layer of the catalyst and the loading (Ic) of the alkali metal element as the cationic component on the innermost layer of the catalyst satisfy the following formula (2-1) or (2-2):

$$Ic \geqq 0.4Sc \quad (2\text{-}1)$$

in the case where the alkali metal is sodium or lithium

$$Ic \geqq 0.6Sc \quad (2\text{-}2)$$

in the case where the alkali metal is potassium, rubidium or cesium, in which said outside surface layer of the catalyst and said innermost layer of the catalyst are as defined above.

4,690,914

PROCESS FOR THE PREPARATION OF AN ABSORBING AND ADSORBING AGENT; AND THE PRODUCT PRODUCED THEREFROM

Francois Callut, Marcinelle-Bruyeres, and Daniel Demeuldre, Hyon-Mons, both of Belgium, assignors to Marginvest S.A. Holding, Luxembourg

Continuation-in-part of Ser. No. 742,201, Jun. 7, 1985, abandoned. This application Mar. 25, 1986, Ser. No. 843,742

Claims priority, application Belgium, Jun. 7, 1984, 213086

Int. Cl.[4] B01J *20/00*

U.S. Cl. 502—400 **24 Claims**

1. A process for the preparation of a noncarcinogenic, chemically inactive and mechanically strong material for use as an absorbing and adsorbing agent including the steps of:

treating a combustible material having a low fuel content of equal to or less than about 50% carbon and selected from the group comprising coal schists, bituminous schists or clays mixed with a fuel such as coal, coal slurry, wood, or organic residues from domestic or other refuse, by pyrolysis at a first temperature between about 350° to about 900° C. for at least two hours under a slightly reduced pressure in a reducing atmosphere wherein gaseous by-products are produced during said pyrolysis treatment;

subsequently sintering said combustible material at a second temperature, said second temperature being higher than said first temperature to produce an absorbing and adsorbing product, said product having no more than trace amounts of carbon therein;

recovering at least a portion of said gaseous by-products; and

using said recovered by-products to provide continued energy to effect said pyrolysis treatment or to provide energy for at least another different activity.

4,690,915

ADOPTIVE IMMUNOTHERAPY AS A TREATMENT MODALITY IN HUMANS

Steven A. Rosenberg, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Aug. 8, 1985, Ser. No. 763,657

Int. Cl.[4] A61K *37/02'45/05*

U.S. Cl. 514—2 **11 Claims**

1. A method of treating cancer in humans comprising systemically administering to a human suffering from cancer other than sarcomas, an effective amount of interleukin-2 and interleukin-2-activated autologous human lymphocytes to cause regression of said cancer.

4,690,916

NONA AND DECAPEPTIDE ANALOGS OF LHRH USEFUL AS LHRH ANTAGONISTS

John J. Nestor, Jr., San Jose, and Brian Vickery, Cupertino, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Nov. 13, 1984, Ser. No. 671,153

Int. Cl.[4] A61K *37/43;* **C07K** *7/20*

U.S. Cl. 514—15 **13 Claims**

1. A compound of the formula

$$\underset{1\ 2\ 3\ 4\ 5\ 6\ 7}{A\text{—}B\text{—}C\text{—}D\text{—}E\text{—}F\text{—}G\text{—}Arg\text{—}Pro\text{—}H} \quad \underset{8\ \ 9\ \ 10}{} \quad (I)$$

or a pharmaceutically acceptable salt thereof, wherein:

A is an amino acyl residue selected from the group consisting of N-Ac-D,L-$\Delta^{3,4}$-prolyl, N-Ac-D,L-prolyl, N-Ac-L-alkylprolyl, N-Ac-D,L-phenylalanyl, N-Ac-D,L-p-Cl-phenylalanyl, N-Ac-D,L-seryl, N-Ac-D,L-threonyl, N-Ac-D,L-alanyl, N-Ac-3-(1-naphthyl)-D,L-alanyl, N-Ac-3-(2-naphthyl)-D,L-alanyl, N-Ac-3-(2,4,6-trimethyl-

phenyl)-D,L-alanyl, and N-Ac-3-(4-trifluoromethylphenyl)-D,L-alanyl;

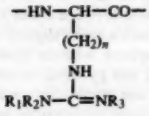
B is an amino acyl residue selected from the group consisting of D-phenylalanyl, D-p-Cl-phenylalanyl, D-p-Br-phenylalanyl, D-p-F-phenylalanyl, D-p-nitrophenylalanyl, 3-(3,4,5-trimethoxyphenyl)-D-alanyl, 2,2-diphenylglycine, D-α-methyl-p-Cl-phenylalanyl and 3-(2,4,6-trimethylphenyl)-D-alanyl;

C is an amino acyl residue selected from the group consisting of D-tryptophanyl, D-phenylalanyl, D-pentamethylphenylalanyl, 3-(3-pyridyl)-D-alanyl, 3-(1-naphthyl)-D-alanyl, and 3-(2-naphthyl)-D-alanyl;

D is an amino acyl residue selected from the group consisting of L-seryl, and D-alanyl;

E is an amino acyl residue selected from the group consisting of L-phenylalanyl and L-tyrosyl;

F is an amino acyl residue selected from the group consisting of the radicals represented by the following structural formula:



(II)

wherein

n is 1 to 5;

R_1 is lower alkyl substituted with one to three halo atoms;

R_2 is hydrogen;

R_3 is R_1, methyl, ethyl or $—CH_2CH_2OH$;

G is an amino acyl residue selected from the group consisting of L-leucyl, L-norleucyl, L-tryptophanyl, L-Nal(2) and L-norvalyl; and

H is D-alaninamide, D-leucinamide, glycinamide or $—NHR_5$ wherein R_5 is lower alkyl or $NHCONH_2$.

4,690,917

IMIDAZOPYRIDAYINE DERIVATIVES HAVING ANTIVIRAL ACTIVITY

David J. Knight, Chalfont St Peter; David I. C. Scopes, Furneux Pelham; Richard Storer, Pinner, and Stuart Holman, Northolt, all of England, assignors to Glaxo Group Limited, London, England

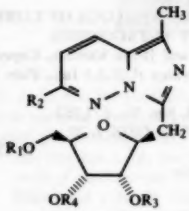
Filed Nov. 22, 1985, Ser. No. 800,667

Claims priority, application United Kingdom, Nov. 23, 1984, 8429694

Int. Cl.[4] A61K *31/70;* **C07H** *3/02*

U.S. Cl. 514—23 **15 Claims**

1. Compounds of the formula:



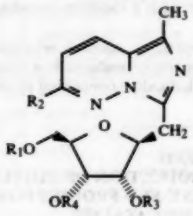
(I)

wherein

R_1, R_3 and R_4 are each independently selected from the group consisting of hydrogen atoms and protecting groups;

R_2 is selected from the group consisting of halogen atoms and groups of formula $—NR_aR_b$ (where R_a and R_b, which may be the same or different, are each selected from hydrogen atoms and alkyl groups; or R_a and R_b may be linked to form, together with the nitrogen atom to which they are attached, a saturated heterocyclic ring which may comprise a further heteroatom selected from the group consisting of nitrogen and oxygen); and their physiological equivalents as well as salts thereof with acids.

10. A method for the therapy or prophylaxis of RNA viral infections in a human or animal subject which comprises administering a therapeutic or prophylactic effective amount of one or more compounds selected from the group consisting of compounds of the formula:



(I)

wherein

R_1, R_3 and R_4 are each independently selected from the group consisting of hydrogen atoms and protecting groups;

R_2 is selected from the group consisting of halogen atoms and groups of formula $—NR_aR_b$ (where R_a and R_b, which may be the same or different, are each selected from hydrogen atoms and alkyl groups; or R_a and R_b may be linked to form, together with the nitrogen atom to which they are attached, a saturated heterocyclic ring which may comprise a further heteroatom selected from the group consisting of nitrogen and oxygen);

physiological equivalents thereof, and physiologically acceptable salts thereof with acids.

4,690,918

USE OF TRICHOSTATIN COMPOUNDS FOR TREATING TUMOR CELLS

Teruhiko Beppu, 1-5-21, Horinouchi, Suginami-ku, Tokyo; Yasushi Iwamoto, Okegawa, and Minoru Yoshida, Tokyo, all of Japan, assignors to Teruhiko Beppu, Tokyo, Japan

Filed Jan. 24, 1986, Ser. No. 821,973

Claims priority, application Japan, Jan. 30, 1985, 60-16085

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—23 **4 Claims**

1. A method for inducing the differentiation of tumor cells, which comprises administering an effective amount of trichostatin A, trichostatin C, or a mixture of trichostatin A and trichostatin C to a recipient.

4,690,919

BENZOXAZINORIFAMYCIN DERIVATIVE, PROCESS FOR PREPARING THE SAME AND ANTIBACTERIAL AGENT CONTAINING THE SAME

Takehiko Yamane, Akashi; Takuji Hashizume, Takasago; Katsuji Yamashita, Kobe, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

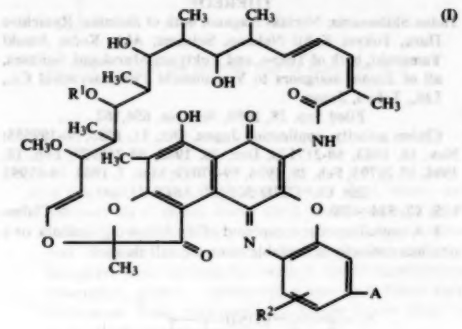
Filed Feb. 5, 1986, Ser. No. 826,398

Claims priority, application Japan, Feb. 5, 1985, 60-20384

Int. Cl.[4] C07D *498/18;* **A61K** *31/535*

U.S. Cl. 514—183 **30 Claims**

1. A rifamycin compound having the formula (I):



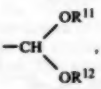
(I)

wherein R^1 is hydrogen atom or acetyl group; R^2 is hydrogen atom or hydroxyl group; A is a group represented by the formula:

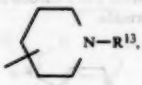
wherein R^3 is an alkyl group with 1 to 5 carbon atoms or an alkoxyalkyl group with 2 to 6 carbon atoms and R^4 is an alkyl group with 1 to 5 carbon atoms, a group represented by the formula: $-(CH_2)_aX^1$, wherein a is 1 to 4 and X^1 is ethynyl group, cyano group, a group having the formula:

wherein R^5 and R^6 are the same or different from each other and are hydrogen atom or an alkyl group with 1 to 3 carbon atoms, a group represented by the formula: OR^7, wherein R^7 is hydrogen atom or an alkyl group with 1 to 4 carbon atoms, a group represented by the formula:

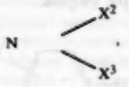
wherein R^8, R^9 and R^{10} are the same or different from each other and are hydrogen atom or an alkoxy group with 1 to 3 carbon atoms, or a group represented by the formula:



wherein R^{11} and R^{12} are the same or different from each other and are an alkyl group with 1 to 3 carbon atoms; a cycloalkyl group with 3 to 8 carbon atoms, a group represented by the formula:

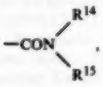


wherein R^{13} is hydrogen atom or an alkyl group with 1 to 3 carbon atoms, or a group represented by the formula: $-CH_2(CHOH)_4CH_2OH$; a group represented by the formula:

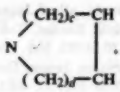


wherein

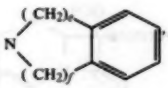
is a 3 to 10 membered cyclic amino group with 2 to 9 carbon atoms, X^2 is hydrogen atom or an alkyl group having 1 to 4 carbon atoms and X^3 is hydrogen atom, an alkyl group with 1 to 3 carbon atoms, hydroxyl group, a group represented by the formula:



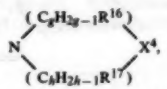
wherein R^{14} and R^{15} are the same or different from each other and are hydrogen atom or an alkyl group with 1 to 4 carbon atoms, a hydroxyalkyl group with 1 to 3 carbon atoms or cyclic or noncyclic amino group with 2 to 6 carbon atoms, or X^2 and X^3 when taken together represent =O group or the group having the formula: $-O(CH_2)_bO-$, wherein b is 2 to 4, a group represented by the formula:



wherein c and d are the same or different from each other and are 1 to 4, a group represented by the formula:



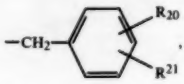
wherein e and f are the same or different from each other and are 1 to 4, or a group represented by the formula:



wherein g and h are the same or different from each other and are 1 to 4, R^{16} and R^{17} are the same or different from each other and are hydrogen atom or an alkyl group with 1 to 3 carbon atoms and X^4 is oxygen atom, sulfur atom or a group

represented by the formula: NR^{18}, wherein R^{18} is hydrogen atom, an alkyl group with 1 to 3 carbon atoms, a phenyl group represented by the formula:

wherein R^{19} is hydrogen atom or trifluorometyl group, or a group represented by the formula:



wherein R^{20} and R^{21} are hydrogen atoms or when taken together represent the group having the formula: $-OCH_2O-$, or a pharmaceutically acceptable salt of the rifamycin compound of formula (I) formed with a base or an acid.

4,690,920

DERIVATIVE OF CEPHALOSPORANIC ACID AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Akihiko Kanno; Shigeaki Muto, both of Tokyo; Koichi Niimura, Sayama; Takao Ando; Takayoshi Fujii, both of Tokyo; Masahiko Fujii, Komae; Takao Furusho, Machida, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

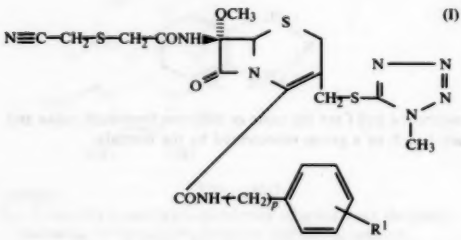
Filed Dec. 20, 1983, Ser. No. 563,515

Claims priority, application Japan, Dec. 29, 1982, 57-234550

Int. Cl.[4] C07D *501/57;* **A61K** *31/545*

U.S. Cl. 514—201 **21 Claims**

1. A substituted cephalosporin represented by the formula (I):



(I)

wherein p is 0, 1 or 2 and R^1 represents a hydrogen atom, a hydroxyl group, a carbamoyl group, an alkyl group having 1 to 4 carbon atoms, $-(CONH)_m(CH_2)_n-COOH$ wherein m is 0 or 1 and n is 0, 1 or 2, carboxylic ester or carboxylic salt thereof.

4,690,921

CEPHALOSPORIN COMPOUNDS AND SALTS THEREOF

Tadao Shibanuma; Noriaki Nagano, both of Saitama; Ryuichiro Hara, Tokyo; Kohji Nakano, Saitama; Akio Koda; Atsuki Yamazaki, both of Tokyo, and Yukiyasu Murakami, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

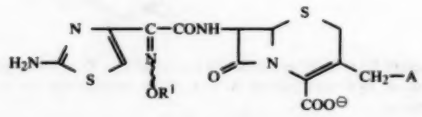
Filed Sep. 28, 1984, Ser. No. 656,162

Claims priority, application Japan, Oct. 11, 1983, 58-189555; Nov. 18, 1983, 58-217170; Dec. 26, 1983, 58-248929; Feb. 15, 1984, 59-26793; Feb. 28, 1984, 59-37019; Mar. 7, 1984, 59-41992

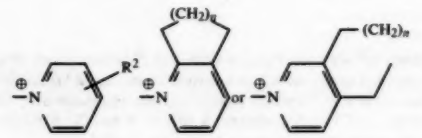
Int. Cl.[4] C07D *501/34;* **A61K** *31/545*

U.S. Cl. 514—205 **9 Claims**

1. A cephalosporin compound of the following formula, or a pharmaceutically acceptable nontoxic salt thereof:



wherein the wavy line means syn-form and anti-form bonds, R^1 represents an aminothiaxolylmethyl group, and A represents



in the above formulas, n represents an integer of 1 to 2, R^2 represents a hydrogen atom, a sulfo group, $-(CH_2)_mCOOH$, $-(CH_2)_mOH$, $-(CH_2)mNHR^3$, or $-CONHR^4$; in these formulas, m represents O or an or an integer of 1 to 3, R^3 represents a hydrogen atom or a formyl, acetyl, propionyl or oxalo group, and R^4 represents a carboxy lower alkyl group or a hydroxyl group.

4,690,922

2-(HETEROCYCLOALKYLTHIO)PENEMS

Ashit K. Ganguly, Upper Montclair; Viyyoor M. Girijavallabhan, Parsippany; Patrick A. Pinto, Mine Hill, and Richard W. Versace, Ringwood, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 564,586, Dec. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 475,281, Mar. 14, 1983, abandoned. This application Jul. 2, 1984, Ser. No. 626,820

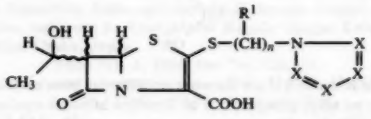
Claims priority, application Denmark, Feb. 29, 1984, 1417/84; European Pat. Off., Mar. 7, 1984, 84102429.2

The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.

Int. Cl.[4] C07D *499/00;* **A61K** *31/425*

U.S. Cl. 514—210 **34 Claims**

1. Compounds of the formula



wherein each x is

or =N—, with the proviso that at least one X is

R is hydrogen, lower alkyl, amino lower alkyl, mono- and di-lower alkyl amino lower alkyl, carboxy lower alkyl, sulfoalkyl, hydroxyalkyl, cyano, hydroxy, amino, mono- and di-lower alkyl amino, alkyl sulfonate, sulfamyl, halogeno, hydroxyliminoloweralkyl, lower alkoxyiminoloweralkyl, carboxy, carbamoyl, mono- or di-lower alkyl carbamoyl, nitro, carbamoyloxy, ureido lower alkyl, or carbamoylhydrazolower alkyl;

R^1 is hydrogen, lower alkyl, carboxy, carbamoyl, cyano, hydroxy, amino, lower alkylthio, fluoro, lower alkoxy, or lower alkanoyloxy, provided that when R^1 is attached to a carbon atom adjacent to S or N, R^1 is not hydroxy, amino, or fluoro; or R^1 is lower alkyl substituted by hydroxy, cyano, halogen, lower alkoxy, carbamoyloxy, $—SR^2$, imidazolyl, substituted imidazolyl wherein the substitutents are as defined by R, amino, amino substituted by lower alkyl, lower alkyl carbonyl, carbamoyl, monoalkyl substituted carbamoyl or ureido, carboxy, carbamoyl, mono-alkyl substituted carbamoyl, lower alkylcarbonyl, lower alkoxycarbonyl, hydroxy lower alkyl carbonyl, sulfo, sulfamyl, lower alkyl thio, lower alkylsulfonyl, lower alkoxysulfonyl, or hydroxy lower alkylsulfonyl;

R^2 is a substituted or unsubstituted heterocyclyl radical selected from the group consisting of benzothiazolyl, oxazinyl, pyridyl, purinyl, imidazolyl, pyrrolyl, thiazolyl, thiadiazolyl, benzimidazolyl, triazinyl, thiazinyl, furyl, thienyl, triazolyl, tetrazolyl and pyrimidyl, wherein there can be one or more substitutents which can be the same or different and (a) are on a ring carbon or heteroatom, and are independently selected from the group consisting of lower alkyl, $—NR^3R^4$, and lower alkylene-NR^3R^4, wherein R^3 and R^4 are independently selected from the group consisting of hydrogen and lower alkyl, or (b) are on a ring carbon atom only and are selected from the group consisting of =O, hydroxy, lower alkoxy, $—COOR^5$ or halogen, wherein R^5 is hydrogen;

n is 1 to 4; and

the pharmaceutically acceptable salts and pharmaceutically acceptable esters thereof, in racemic or opticaly active form.

4,690,923

2-(PERHYDRO-1,4-DIAZINO)-PYRIMIDO(5,4-D)-PYRIMIDINES, PHARMACEUTICAL COMPOSITIONS AND USE

Josef Roch; Erich Müller; Berthold Narr; Josef Nickl; Walter Haarmann, and Johannes M. Weisenberger, all of Biberach, Fed. Rep. of Germany, assignors to Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

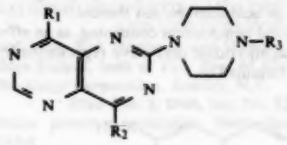
Continuation of Ser. No. 575,322, Jan. 31, 1984, abandoned, which is a continuation-in-part of Ser. No. 350,429, Feb. 27, 1982, abandoned, which is a continuation of Ser. No. 161,010, Jun. 19, 1980, abandoned. This application Mar. 15, 1985, Ser. No. 712,341

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926804; Apr. 11, 1980, 3013930

Int. Cl.[4] A61K *31/54;* **C07D** *417/14, 487/04*

U.S. Cl. 514—222 **8 Claims**

1. A compound of the formula



wherein

R_1 is 2-phenylethyl-mercapto; 3-phenylpropyl-mercapto; 1-(methyl-phenyl)-ethyl-mercapto; (unsubstituted or mono-substituted phenyl)-mercapto, where the substituent is fluorine, chlorine, bromine, methyl, hydroxyl or methoxy; (unsubstituted or mono-substituted benzyl)-mercapto, where the substituent is attached to the phenyl moiety and is fluorine, chlorine, methyl, methoxy or trifluoro-methyl; dichlorobenzyl-mercapto; or dimethoxybenzylmercapto;

R_2 is thiomorpholino-1-oxide or thiomorpholino-1,1-dioxide; and

R_3 is hydrogen or formyl;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

7. An antithrombotic pharmaceutical composition consisting essentially of an inert pharmaceutical carrier and an effective antithrombotic amount of a compound of claim 1.

4,690,924

1,7-NAPHTHYRIDINE DERIVATIVES AND MEDICINAL PREPARATIONS CONTAINING SAME

Susumu Sato, Chiba; Haruyoshi Honda, Tomisato; Teruo Koumoto, Chiba; Kazuo Isomae, Narashino; Tadayuki Kuraishi, Chiba, and Tatsuhiko Katori, Tonemachi, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

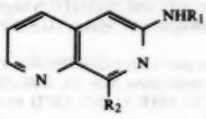
Division of Ser. No. 850,820, Apr. 11, 1986, Pat. No. 4,659,710. This application Dec. 9, 1986, Ser. No. 939,808

Claims priority, application Japan, Apr. 17, 1985, 60-81967

Int. Cl.[4] A61K *31/44, 31/535;* **C07D** *471/04*

U.S. Cl. 514—237 **2 Claims**

1. A 1,7-naphthyridine derivative represented by the formula (I):



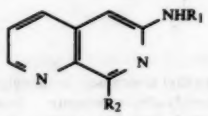
wherein R_1 means a hydrogen atom or denotes a piperidino or morpholino group, an

group, in which R_4 is a hydrogen atom or an alkyl or hydroxyethyl group and R_5 is an alkyl, amino, hydroxyethyl, hydroxypropyl, dihydroxypropyl, dialkylaminoethyl, phenylethyl, alkoxyphenylethyl or pyridylmethyl group, or an

group, in which R_6 is an alkyl, phenyl or hydroxyethyl group

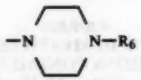
or a cinnamoyl group which may optionally be substituted by one or more alkyl, alkoxy and/or hydroxyl groups and/or halogen atoms; or an acid addition salt thereof.

2. A pharmaceutical composition containing, as an effective ingredient, a 1,7-naphthyridine derivative represented by the following general formula (I):



wherein R_1 means a hydrogen atom or denotes a piperidino or morpholino group, an

group, in which R_4 is a hydrogen atom or an alkyl or hydroxyethyl group and R_5 is an alkyl, amino, hydroxyethyl, hydroxypropyl, dihydroxypropyl, dialkylaminoethyl, phenylethyl, alkoxyphenylethyl or pyridylmethyl group, or an



group in which R_6 is an alkyl, phenyl or hydroxyethyl group or a cinnamoyl group which may optionally be substituted by one or more alkyl, alkoxy and/or hydroxyl groups and/or halogen atoms; or an acid addition salt thereof in association with a pharmaceutically acceptable carrier.

4,690,925

(2-OXO-1,2,3,5-TETRAHYDROIMIDAZO-[2,1-B]QUINAZOLINYL) OXYALKYLAMIDES PROPERTIES HAVING PHOSPHODIOSTERASE INHIBITING

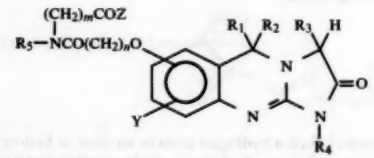
John H. Fried, Palo Alto, and Michael C. Venuti, San Francisco, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 580,409, Feb. 15, 1984, abandoned. This application May 15, 1985, Ser. No. 734,633

Int. Cl.[4] A61K *31/505*; C07D *487/04*

U.S. Cl. 514—267 **21 Claims**

1. A compound according to the formula



(I)

, its optical isomers, or a pharmaceutically acceptable salt thereof wherein:

m and n are integers of 1 to 6;

R_1 is hydrogen or alkyl of 1 to 4 carbons;

R_2 is hydrogen or R_1 and R_2 are combined to form an oxo group;

R_3 is hydrogen, alkyl of 1 to 6 carbons, phenyl, benzyl, hydroxy lower alkyl and its aliphatic acylates of 1 to 6 carbon atoms or aryl acylates of 7 to 12 carbon atoms, carbamoyl alkyl, carboxyalkyl, alkoxycarbonylalkyl or α-amino acid side chains;

R_4 is hydrogen, alkyl of 1 to 6 carbon atoms, benzyl, or hydroxy lower alkyl;

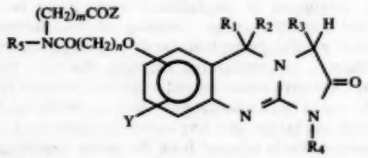
R_5 is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or cycloalkyl lower alkyl of 4 to 12 carbon atoms wherein the cycloalkyl ring is unsubstituted or substituted with a lower alkyl, lower alkoxy, —OH, —$OCOR_6$, halo, —NH_2, —$N(R_6)_2$, —$NHCOR_6$, —COOH, or —$COO(R_6)$ group wherein R_6 is lower alkyl; phenyl or phenyl lower alkyl wherein phenyl is unsubstituted or substituted with 1 or more lower alkyl, halo or lower alkoxy groups or an —NH_2, —$N(R_6)_2$, —$NHCOR_6$, —COOH, or —$COOR_6$ group wherein R_6 is lower alkyl;

Y is hydrogen, alkyl of 1 to 4 carbon atoms, halo or lower alkoxy; and

Z is —OR_7 or —NR_7R_8 wherein R_7 and R_8 are independently hydrogen or lower alkyl;

or a pharmaceutically acceptable salt thereof.

18. A method for inhibiting 3',5'-cyclic AMP phosphodiesterase which method comprises administering a cyclic AMP phosphodiesterase inhibiting amount of a compound of the formula



(I)

, its optical isomers, or a pharmaceutically acceptable salt thereof wherein:

m and n are integers of 1 to 6;

R_1 is hydrogen or alkyl of 1 to 4 carbons;

R_2 is hydrogen or R_1 and R_2 are combined to form an oxo group;

R_3 is hydrogen, alkyl of 1 to 6 carbons, phenyl, benzyl, hydroxy lower alkyl and its aliphatic acylates of 1 to 6 carbon atoms or aryl acylates of 7 to 12 carbon atoms, carbamoyl alkyl, carboxyalkyl, alkoxycarbonylalkyl or α-amino acid side chains;

R_4 is hydrogen, alkyl of 1 to 6 carbons, benzyl, or hydroxy lower alkyl;

R_5 is hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or cycloalkyl lower alkyl of 4 to 12 carbon atoms wherein the cycloalkyl ring is unsubstituted or substituted with a lower alkyl, lower alkoxy, —OH, —$OCOR_6$, halo, L—NH_2, —$N(R_6)_2$, —$NHCOR_6$, —COOH, or —$COO(R_6)$ group wherein R_6 is lower alkyl; phenyl or phenyl lower alkyl wherein phenyl is unsubstituted or substituted with 1 or more lower alkyl, halo or lower alkoxy group or an —NH_2, —$N(R_6)_2$, —$NHCOR_6$, —COOH, or —$COOR_6$ group wherein R_6 is lower alkyl;

Y is hydrogen, alkyl of 1 to 4 carbon atoms, halo or lower alkoxy; and

Z is —OR_7 or —NR_7R_8 wherein R_7 and R_8 are independently hydrogen or lower alkyl.

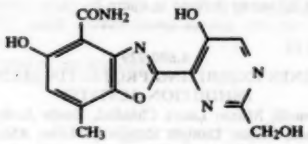
4,690,926

BOXAZOMYCIN A AND B, NEW ANTIBIOTICS CONTAINING BENZOXAZOLE NUCLEUS

Kyoichiro Saitoh, Zushi; Masataka Konishi, Kawasaki, and Koji Tomita, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

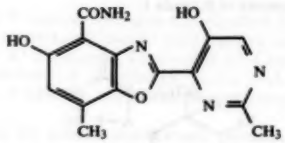
Filed Feb. 3, 1986, Ser. No. 825,498
Int. Cl.[4] A61K *31/42*; C07D *263/58*
U.S. Cl. 514—269 12 Claims

1. The antibiotic compound boxazomycin A which has the structure:



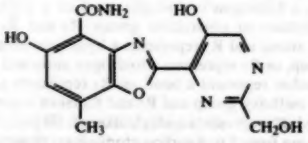
or a nontoxic salt thereof.

3. The antibiotic compound boxazomycin B which has the structure:



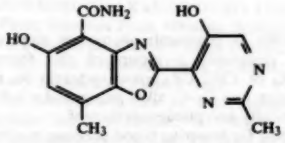
or a nontoxic acid addition salt thereof.

5. A method for therapeutically treating a host animal affected by a microbial infection which comprises administering to said host animal an antimicrobially effective amount of boxazomycin A of the formula



or a nontoxic salt thereof, or a pharmaceutical composition thereof.

7. A method for therapeutically treating a host animal affected by a microbial infection which comprises administering to said host animal an antimicrobially effective amount of boxazomycin B of the formula



or a nontoxic acid addition salt thereof, or a pharmaceutical composition thereof.

4,690,927

PHARMACEUTICAL COMPOSITIONS WITH ANALGESIC PROPERTIES AND THE PREPARATION AND USE THEREOF

Harald Voss, Bad Homburg, and Herbert Rothweiler, Rheinfelden-Eichsel, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 3, 1986, Ser. No. 825,293
Claims priority, application Switzerland, Feb. 8, 1985, 570/85-4
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—282 15 Claims

1. A pharmaceutical composition having analgesic properties comprising a pharmaceutically acceptable salt of diclophenac and a pharmaceutically acceptable salt of codeine in a weight ratio of about 1:1 to about 3:1.

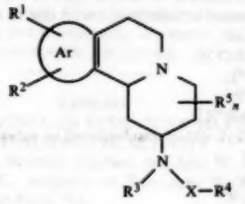
4,690,928

SUBSTITUTED HEXAHYDRO ARYLQUINOLIZINES AS α_2 BLOCKERS

Joel R. Huff, Lederach; Joseph P. Vacca, Telford, and John J. Baldwin, Gwynedd Valley, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 755,863, Jul. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 680,678, Dec. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 576,233, Feb. 2, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 885,511
Int. Cl.[4] A61K *31/445*; C07D *491/147, 495/14*
U.S. Cl. 514—285 51 Claims

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof wherein

Ar represents an aromatic heterocycle selected from R^1, R^2-benzo[b]furo-, R^1, R^2-benzo[b]thieno-, thieno- and furo-;

R^1 and R^2 are independently:

(1) hydrogen,
(2) halo,
(3) hydroxy,
(4) C_{1-3} alkoxy, or
(5) C_{1-6} alkyl;

R^3 is

(1) hydrogen,
(2)

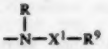
wherein R is hydrogen or C_{1-3} alkyl,

(3) C_{1-6} alkyl, either unsubstituted or substituted with one or more of;
(a) hydroxy,
(b) carboxy,
(c) C_{1-3} alkoxycarbonyl,
(d) halo,
(e) C_{1-3} alkoxy,
(f) $—CONR^6R^7$, wherein R^6 and R^7 are the same or different and are hydrogen or C_{1-5} alkyl, or joined together directly to form a pyrrolidino or piperidino

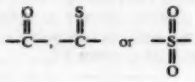
ring or through a heteroatom to form a morpholino, piperazino or N-C_{1-3} alkylpiperazino heterocycle, or

(g) $-NR^6R^7$;

(h)



wherein X^1 is



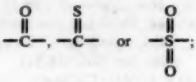
and R^9 is

(i) C_{1-3} alkoxy,

(ii) C_{1-3} alkyl, or

(iii) NR^6R^7;

X is



and

R^4 is

(1) $-OR^8$, wherein R^8 is hydrogen or C_{1-6} alkyl, either unsubstituted or substituted with one or more of;

(a) OR, or

(b) —NRCOR;

(2) $-N(R^8)_2$,

(3) $-CO^2R^8$,

(4) $-CONR^6R^7$,

(5) C_{1-6} alkyl, either unsubstituted or substituted with

(a) OR8

(b) halo,

(c) CO_2 R^8

(d) $CONR^6R^7$,

(6) C_{2-5} alkenyl,

(7) C_{2-5} alkynyl,

(8) C_{3-6} cycloalkyl,

(9) 5 or 6-membered heterocycle selected from imidazo, thiazolo, oxazolo, furamyl piperidino, piperzino, pyridino and pyrazino, or phenyl or napthyl, either unsubstituted or substituted with one or more of;

(a) halo, or

(b) OR, or

(c) C_{1-3} alkyl;

R^5 is independently

(1) C_{1-6} alkyl, either unsubstituted or substituted with one or more of

(a) $-OR^8$,

(b) $-NR^8COR^8$, or

(c) $-CO_2R^8$,

(2) $-CO_2R^8$, or

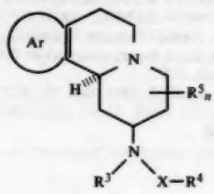
(3) $-CONR^6R^7$;

n is 0, 1, 2 or 3; and

R^3 and R^4 taken together form a 2-oxazolidinon-1-yl or succinimidoyl group or;

R^3 and R^5 or R^4 and R^5, if R^5 is in the 1- or 3-position and both are alkyl, can be joined together to form a 5- or 6-membered ring.

19. A method of antagonizing α_2-adrenoceptors which comprises administering to a patient in need of such treatment an effective α_2-adrenoceptor antagonist amount of a compound of structural formula:



or a pharmaceutically acceptable salt thereof wherein Ar, R^3, X, R^4, and R^5 are as defined in claim **1**.

4,690,929

ERGOLINES EXHIBITING PROTACTIN SECRETION INHIBITION ACTIVITY

Luigi Bernardi, Milan; Laura Chiodini, Busto Arsizio; Sergio Mantegani, Milan; Daniela Ruggieri, Milan; Aldemio Temperilli, Milan, and Patricia Salvati, Milan, all of Italy, assignors to Farmitalia Carlo Erba, Milan, Italy

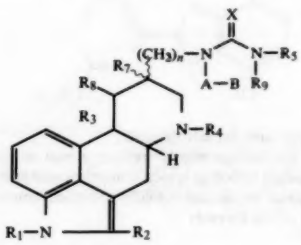
Filed Apr. 26, 1984, Ser. No. 604,041

Claims priority, application United Kingdom, Apr. 28, 1983, 8311679; May 27, 1983, 8314816

Int. Cl.[4] **A61K** *31/48;* **C07D** *457/04*

U.S. Cl. 514—288 **7 Claims**

1. A compound of formula I:



I

wherein R_1 represents a hydrogen atom or a methyl group; R_2 represents a hydrogen or halogen atom or a methyl, cyano, C_1–C_4 alkylthio or phenylthio group; R_7 and R_8 represent hydrogen atoms and R_3 represents a hydrogen atom or a methoxy group, or R_7 represents a hydrogen atom and R_3 and R_8 taken together represent a bond, or R_3 represents a hydrogen atom or a methoxy group and R_7 and R_8 taken together represent a bond; R_4 represents a alkyl, alkenyl, alkynyl, cycloalkyl group having from 1 to 4 carbon atoms; R_5 represents a hydrogen atom or a alkyl, alkenyl, alkynyl, cycloalkyl group having from 1 to 4 carbon atoms or a phenyl group; X represents an oxygen or sulphur atom or an imino group, R_9 represents a hydrogen atom and B represents a cyano, a C_2–C_5 alkoxycarbonyl or carbamoyl group, or R_9 and B taken together represent a

group wherein W represents an oxygen atom or an imino group; A represents a group of the formula CHR_6, CH_2—CHR_6 or CH=CR_6 group wherein R_6 represents a hydrogen atom or a C_1–C_4 alkyl group; and n is 0, 1 or 2; or a pharmaceutically acceptable salt thereof.

7. A method for lowering blood pressure in a human which method comprises administering to a subject in need of such treatment a therapeutically effective amount of the compound of claim **1** or a pharmaceutically acceptable salt thereof or a

pharmaceutical composition containing a therapeutically effective amount of the compound of claim 1 or a pharmaceutically acceptable salt thereof.

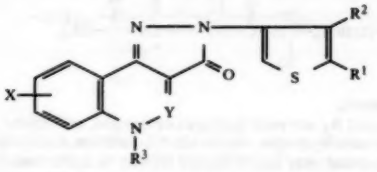
4,690,930

PYRAZOLO[4,3-C]QUINOLINE-3-ONE AND IMIDAZO[4,3-C]CINNOLIN-3-ONE DERIVATIVES AND THEIR USE AS PSYCHOTROPIC AGENTS

Susumu Takada, Hyogo; Takashi Sasatani, Nara; Hirohisa Shindo, Osaka; Akira Matsushita, Hyogo, and Masami Eigyo, Nara, all of Japan, assignors to Shionogi & Co., Ltd, Osaka, Japan

Filed Nov. 5, 1985, Ser. No. 795,168
Claims priority, application Japan, Nov. 5, 1984, 59-233511
Int. Cl.[4] A61K *31/415;* **C07D** *471/04, 237/28*
U.S. Cl. 514—293 **13 Claims**

1. A compound of the formula:

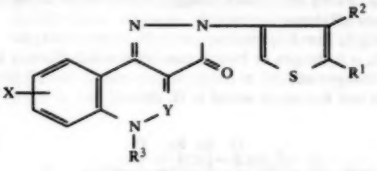


(I)

wherein R^1 and R^2 each is hydrogen, C_1—C_5 alkyl, halogen, nitro or trifluoromethyl, or R^1 and R^2 taken together may form C_3–C_4 alkylene; R^3 is hydrogen, C_1–C_5 alkyl, C_1–C_5 alkanoyl or C_1–C_5 alkylsulfonyl; X is hydrogen, C_1–C_5 alkyl, C_1–C_5 alkoxy, halogen or hydroxy; and Y is methine or nitrogen or a salt thereof.

12. A method for treating psychotropic disorders which comprises administering to a patient an effective amount of a pharmaceutical composition comprising:

a psychotropically effective amount of a compound of the formula:



(I)

wherein R^1 and R^2 each is hydrogen, C_1–C_5 alkyl, halogen, nitro or trifluoromethyl, or R^1 and R^2 taken together may form C_3–C_4 alkylene; R^3 is hydrogen, C_1–C_5 alkyl, C_1–C_5 alkanoyl or C_1–C_5 alkylsulfonyl; X is hydrogen, C_1–C_5 alkoxy, halogen or hydroxy; and Y is methine or nitrogen; or a pharmaceutically acceptable salt thereof admixture with

a pharmaceutically acceptable diluent.

4,690,931

THERAPEUTICALLY USEFUL 1-PHENYL-2-PIPERIDINOALKANOL DERIVATIVES

Alexander Wick, Paris; Jonathan Frost, Wissous; Bernard Gaudilliere, Nanterre; Jean Bertin, Clamart; Regis Dupont, Villebon sur Yvette, and Jean Rousseau, Bourg la Reine, all of France, assignors to Synthelabo, Paris, France

Continuation of Ser. No. 540,648, Oct. 11, 1983, abandoned. This application Sep. 9, 1985, Ser. No. 773,926
Claims priority, application France, Oct. 13, 1982, 82 17187
Int. Cl.[4] C07D *211/18;* **A61K** *31/445*
U.S. Cl. 514—317 **3 Claims**

1. The compound 2-[4-(4-fluorobenzyl)-piperidino]-1-(4-chlorophenyl)-ethanol or a pharmaceutically acceptable acid addition salt thereof.

2. A method for treating a subject suffering from anoxia, comprising administering to said subject an amount of a compound according to claim 1 effective for the treatment of anoxia.

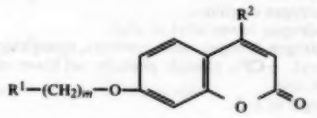
4,690,932

COUMARINS WITH IMIDAZOLYL GROUP OR PYRIDYLOXY GROUP HAVING PLATELETES AGGREGATION INHIBITING ACTIVITY

Tadao Kojima, Saitama; Shunji Kageyama; Minoru Okada, both of Tokyo; Isao Ohata, and Noboru Sato, both of Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 626,283, Jun. 29, 1984, abandoned. This application May 30, 1986, Ser. No. 871,155
Claims priority, application Japan, Jul. 5, 1983, 58-122222
Int. Cl.[4] C07D *405/12;* **A61K** *31/44*
U.S. Cl. 514—337 **18 Claims**

1. A coumarin compound of the formula



wherein R^1 represents an imidazolyl group or a pyridyloxy group which may be substituted by lower alkyl group(s) of from 1 to 5 carbon atoms; R^2 represents a hydrogen atom or a lower alkyl group; and m represents an integer of 1 to 6; or a pharmacologically acceptable salt thereof.

4,690,933

PYRIDYLVINYL-1H TETRAZOLE HAVING ANTIHISTAMINE ACTIVITY

Geoffrey G. Coker, Bromley, England, and John W. A. Findlay, Chapel Hill, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jul. 27, 1984, Ser. No. 635,433
Int. Cl.[4] C07D *401/02;* **A61K** *31/44*
U.S. Cl. 514—343 **3 Claims**

1. 5-(E-6-[3-Pyrrolidino-1-(4-tolyl)prop-1E-enyl]-2-pyridylvinyl)-1H-tetrazole.

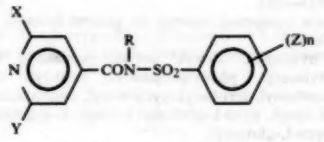
4,690,934

N-PHENYLSULFONYLISONICOTINAMIDE DERIVATIVES AND THEIR USE AS FUNGICIDES OR BACTERICIDES

Hiroshi Yoshida, Tokyo; Kenji Konishi; Kengo Koike, both of Ageo; Taizo Nakagawa, Omiya; Shizuo Shimano, and Seiji Mochizuki, both of Ageo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

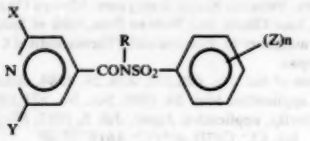
Filed Sep. 9, 1986, Ser. No. 905,133
Claims priority, application Japan, Sep. 25, 1985, 60-210097; Mar. 28, 1986, 61-68734
Int. Cl.[4] A61K *31/44;* **C07D** *213/81*
U.S. Cl. 514—354 **17 Claims**

1. A compound of the formula:



wherein
X is halogen, lower alkoxy or methylthio,
Y is hydrogen or chloro,
R is hydrogen, lower alkyl or allyl,
Z is hydrogen, lower alkyl, halogen, nitro, methoxy, methylthio, methylsulfonyl, $-CF_3$, phenyl, phenoxy or lower alkoxycarbonyl, and
n is an integer of 1 to 3.

6. A fungicidal or bactericidal composition which comprises as the active ingredient, a fungicidally or bactericidally effective amount of the compound of the formula:


(I)

wherein
X is a halogen, lower alkoxy, lower alkylthio, nitro or methyl,
Y is hydrogen or chloro,
R is hydrogen, lower alkyl or allyl,
Z is hydrogen, halogen, nitro, methoxy, methylthio, methylsulfonyl, $-CF_3$, phenyl, phenoxy or lower alkoxycarbonyl, and
n is integer of 1–3.

4,690,935

INHIBITION OF TUMOR GROWTH AND METASTASIS WITH CALCIUM CHANNEL BLOCKER COMPOUNDS

John D. Taylor, Detroit, and Kenneth V. Honn, Grosse Pointe Woods, both of Mich., assignors to Wayne State University, Detroit, Mich.

Filed Mar. 31, 1983, Ser. No. 480,704
Int. Cl.[4] **A61K** *31/44, 31/55, 31/495, 31/275, 31/125*
U.S. Cl. 514—356 **7 Claims**

1. A method for reducing interaction between blood platelets and malignant tumors present in the blood and resulting attachment of the tumors with the platelets in blood vessels in a mammal which comprises:
administering to a mammal in need thereof an effective amount of a calcium channel blocker compound selected from the group consisting of phenylalkyamines, benzothiapenes, diphenylalkylamines and 1,4-dihydropyridines which is substituted in the 4-position which reduces the interaction between the platelets and the tumors and resulting attachment of the tumors with the platelets in the blood vessels without treating the tumors to thereby interfere with the metastatic cascade in the mammal and wherein in vitro the calcium channel blocker compounds prevent aggregation of tumor cells and platelets.

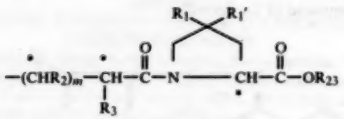
4,690,936

ANTI-HYPERTENSIVE AGENTS

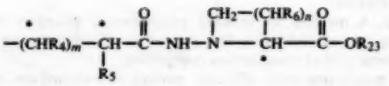
James W. Ryan; Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Continuation-in-part of Ser. No. 127,472, Mar. 5, 1980. This application May 2, 1980, Ser. No. 145,772
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] **A61K** *31/40, 31/41;* **C07D** *207/00, 211/72*
U.S. Cl. 514—362 **54 Claims**

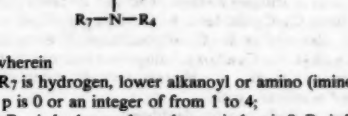
1. A new compound having the general formula R—A—S—Z wherein,
R is hydrogen, formyl, acetyl, propanoyl, butanoyl, phenylacetyl, phenylpropanoyl, benzoyl, cyclopentanecarbonyl, tert-butyloxycarbonyl, cyclopentanecarbonyl-L-lysyl, pyro-L-glutamyl-L-lysyl, L-arginyl, L-lysyl or pyro-L-glutamyl;
A is a divalent moiety derived from phenylglycine, β-benzyl aspartic acid, γ-benzyl glutamic acid, S-benzyl cysteine, O-benzyl aspartic acid, O-benzyl tyrosine, O-benzyl threonine, β-phenyl serine, thyronine, β-2-thienylserine, β-2-thienylalanine, α-methyl histidine, α-methyl tyrosine, α-methyl phenylalanine, α-methyl tryptophan, substituted tyrosine wherein the substituent is halo, nitro, methoxy or hydroxy, or substituted phenylaline wherein the substituent is selected from nitro, amino and methoxy or substituted tryptophan wherein the substituent is selected from methyl and methoxy, the α-amino group of which moiety is in amide linkage with R when R is acyl, and forms a primary amino group with R when R is H, and the carboxyl group of which moiety is in thioester linkage with S;
S is a sulfur atom joined in thioester linkage to A; and Z is selected from the following:


II.

wherein,
(i) R_1 and R_1' are each hydrogen or halogen, and R_2 and R_3 are each hydrogen, lower alkyl or trifluoromethyl provided that only one of R_2 and R_3 may be trifluoromethyl and further provided that at least one of R_1, R_1', R_2 and R_3 must be halogen or trifluoromethyl
(ii) R_{23} is hydrogen or lower alkyl and
(iii) m is 0 or 1;


III.

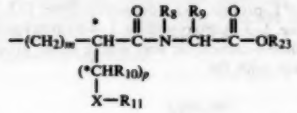
wherein
(i) R_4 and R_5 are each hydrogen, lower alkyl or phenyl-lower alkylene
(ii) N is 1, 2 or 3
(iii) R_6 is hydrogen or hydroxy or when n is 2, R_6 may also be halogen and
(iv) m and R_{23} are as stated in II. above;


IV.

wherein
(i) R_7 is hydrogen, lower alkanoyl or amino (imino)methyl;
(ii) p is 0 or an integer of from 1 to 4;
(iii) R_{25} is hydrogen but when m is 1, p is 0, R_4 is hydrogen and R_7 is selected from hydrogen, lower alkyl and hydroxy lower alkylene; and R_9 is selected from hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, hydroxy-lower alkylene, hydroxy-phenyl-lower alkylene, mercapto-lower alkylene, lower alkyl-thio-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, carbamoyl-lower alkylene and carboxy-lower alkylene, but R_8 and R_9 may together constitute a $(CH_2)_v$ bridge wherein v is 3 or 4, thus forming a 5 or 6-membered ring with the N and C to which R_8 and R_9 are respectively attached and in such instance when v is 3 one hydrogen of $(CH_2)_v$ may be replaced by OH or halogen and when v is 4, one such hydrogen may be replaced by OH;
(v) m and R_{23} are each as defined in II. above; and

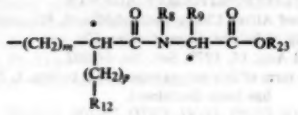
(vi) R_4 is as defined in III. above, provided further, however, that m and p may not both be 0;

V.



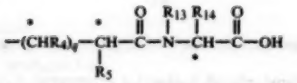
wherein
(i) R_{10} is hydrogen or lower alkyl;
(ii) R_{11} is hydrogen, lower alkyl or lower alkanoyl
(iii) X is 0 or S;
(iv) m and R_{23} are as stated in II. above, and
(v) R_8, R_9 and p are as stated in IV. above;

VI.



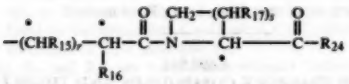
wherein
(i) R_{12} is selected from carboxy, lower alkoxycarbonyl, carbamoyl, N-substituted carbamoyl and cyano;
(ii) m and R_{23} are as stated in II. above; and
(iii) R_8, R_9 and p are as stated in IV. above.

VII.



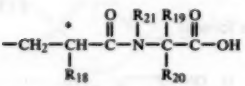
wherein
(i) R_{13} is hydrogen, lower alkyl or phenyl-lower alkylene;
(ii) R_{14} is selected from hydrogen, lower alkyl, phenyl-lower alkylene, hydroxy-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, imidazolyl-lower alkylene, indolyl-lower alkylene, mercapto-lower alkylene, lower alkyl-thio-lower alkylene, carbamoyl-lower alkylene and carboxy-lower alkylene;
(iii) R_4 and R_5 are each as stated in III. above; and
(iv) q is 0, 1 or 2;

VIII.



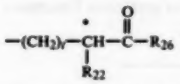
wherein
(i) R_{15} and R_{16} are each hydrogen, lower alkyl, phenyl or phenyl-lower alkylene;
(ii) r is 0, 1 or 2;
(iii) s is 1, 2 or 3;
(iv) R_{17} is hydrogen, hydroxy or lower alkyl and when s is 2, R_{17} may also be halogen;
(v) R_{24} is hydroxy, amino or lower alkoxy;

IX.

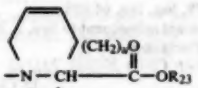


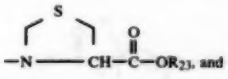
wherein
(i) R_{18} is hydrogen or lower alkyl;
(ii) R_{19} and R_{20} are each lower alkyl and may together constitute a $(CH_2)_w$ bridge wherein w is 4, to form a ring of 5-carbons with the carbon to which they are each attached;
(iii) R_{21} is hydrogen or lower alkyl and may constitute with R_{19} a $(CH_2)_x$ bridge wherein x is 3, to form a five-membered ring with the N and C to which they are respectively attached;

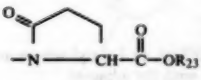
X.



wherein
(i) R_{22} is hydrogen or lower alkyl;
(ii) t is 0 or 1; and
(iii) R_{26} is selected from

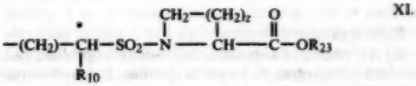






wherein u is 0 or 1 and R_{23} is as defined for formula II., above;

XI.



wherein
(i) z is 2 or 3;
(ii) R_{10} is as stated in V. above; and
(iii) R_{23} is as stated in II. above.

4,690,937

ANTI-HYPERTENSIVE AGENTS

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

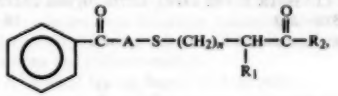
Filed Aug. 14, 1979, Ser. No. 64,897

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] **A61K** *31/40, 31/41;* **C07D** *207/00, 211/72*

U.S. Cl. 514—362 **18 Claims**

1. A new compound having the formula



wherein A is L-tryptophyl, L-tyrosyl, or L-histidyl, whose amino group is in amide linkage with the adjacent

R_1 is hydrogen or methyl;

R_2 is a residue of L-proline, L-3,4-dehydroproline, D,L-3,4-dehydroproline, L-3-hydroxyproline, L-4-hydroxyproline or L-thiazolidine-4-carboxylic acid whose imino group is in imide linkage with the adjacent

and

n is 0 or 1, such that when n=0, R_1 is methyl.

4,690,938

ANTI-HYPERTENSIVE AGENTS

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

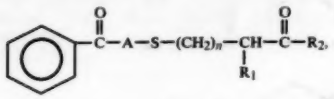
Filed Aug. 14, 1979, Ser. No. 64,898

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/40, 31/41;* **C07D** *207/00, 211/72*

U.S. Cl. 514—362 **15 Claims**

1. A new compound having the formula



A is glycyl, L-isoleucyl, L-leucyl, or L-valyl whose amino group is in amide linkage with the adjacent

R_1 is hydrogen or methyl:

R_2 is a resdue of L-proline, L-3,4-dehydroproline, D,L-3,4-dehydroproline, L-3-hydroxyproline, L-4-hydroxyproline or L-thiazolidine-4-carboxylic acid whose imino group is in imide linkage with the adjacent

and,

n is 0 or 1, such that when n=0, R_1 is methyl.

4,690,939

ANTI-HYPERTENSIVE AGENTS

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

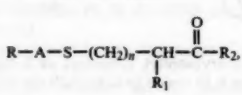
Filed Aug. 14, 1979, Ser. No. 64,900

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] H61K *31/40, 31/41;* **C07D** *207/00, 211/72*

U.S. Cl. 514—362 **18 Claims**

1. A new compound having the formula



wherein

R is formyl, acetyl, propanoyl, butanoyl, phenylacetyl or phenylpropanoyl;

A is L-phenylalanyl, glycyl, L-alanyl, L-tryptophyl, L-tyrosyl, L-isoleucyl, L-leucyl, L-histidyl or L-valyl whose α-amino group is in amide linkage with R;

R_1 is hydrogen or methyl;

R_2 is a residue of L-proline, L-3,4-dehydroproline, D,L-3,4-dehydroproline, L-3-hydroxyproline, L-4-hydroxyproline or L-thiazolidine-4-carboxylic acid whose imino group is in imide linkage with the

and,

n is 0 or 1, such that when n=0, R_1 is methyl.

4,690,940

ANTI-HYPERTENSIVE AGENTS

James W. Ryan, and Alfred Chung, both of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

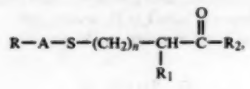
Filed Aug. 14, 1979, Ser. No. 64,902

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/40, 31/41;* **C07D** *207/00, 211/72*

U.S. Cl. 514—362 **18 Claims**

1. A new compound having the formula



wherein R is cyclopentylcarbonyl-L-lysyl or pyro-glutamy-L-lysyl;

A is L-phenylalanyl, glycyl, L-alanyl, L-tryptophyl, L-tyrosyl, L-isoleucyl, L-leucyl, L-histidyl or L-valyl whose amino group is in amide linkage with R:

R_1 is hydrogen or methyl

R_2 is a residue of L-proline, L-3,4-dehydroproline, D,L-3,4-dehydro-proline, L-3-hydroxyproline, L-4-hydroxyproline or L-4-carboxylic acid whose imino group is in imide linkage with the

and,

n is 0 or 1, such that when n=0, R_1 is methyl.

4,690,941

CERTAIN TRIAZOLE COMPOUNDS AND THEIR USE AS FUNGICIDES

Paul A. Worthington, and Margaret C. Shephard, both of Maidenhead, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 29, 1976, Ser. No. 745,780

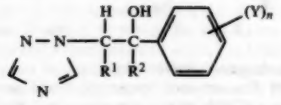
Claims priority, application United Kingdom, Dec. 3, 1975, 49656/75; Nov. 16, 1976, 47666/76

The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

Int. Cl.[4] C07D *249/08;* **A01N** *43/64*

U.S. Cl. 514—383 **5 Claims**

1. A compound of the formula



wherein R^1 is butyl or benzyl; R^2 is hydrogen; Y is hydrogen, halogen, nitro, C_{1-4} alkyl, C_{1-4} alkoxy or unsubstituted amino, and n is 0, 1 or 2; or a fungicidal acid salt of said compound.

4. A fungicidal composition consisting essentially of, as active ingredient, a fungicidally effective amount of a compound, salt or complex as claimed in claim **1**, and a inert carrier for the active ingredient.

4,690,942

1-ARYL-2-FLUORO-2-AZOLYL ALKANONES, ALKANOLS, ESTERS, AND ETHERS, COMPOSITION CONTAINING THEM, AND USE OF THEM TO CONTROL PHYTOPATHOGENIC MICROORGANISMS

Willy Frick, Pfeffingen; Alfred Meyer, and Robert Nyfeler, both of Basel, all of Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

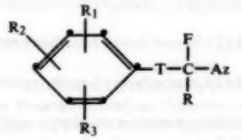
Filed Dec. 14, 1984, Ser. No. 681,989

Claims priority, application Switzerland, Dec. 20, 1983, 6757/83; Jun. 5, 1984, 2731/84

Int. Cl.[4] **A01N** *43/50, 43/653;* **C07D** *233/60, 249/08*

U.S. Cl. 514—383 **20 Claims**

1. A compound of formula I

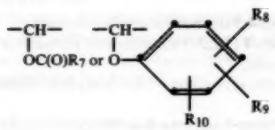


(I)

wherein

Az is 1H-1,2,4-triazol-1-yl, 4H-1,2,4-triazol-4-yl or 1H-imidazol-1-yl;

T is —CH(OH)— or one of the groups



wherein

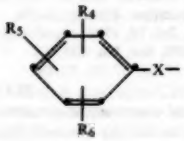
R_7 is C_1–C_6alkyl which is unsubstituted or substituted by C_1–C_3alkoxy, halogen or cyano, or is C_3–C_6alkenyl, C_3–C_6alkynyl, C_3–C_6cycloalkyl, 2-furyl, 2-tetrahydrofuryl, or is phenyl or benzyl, each unsubstituted or substituted by halogen, nitro, C_1–C_3alkyl, C_1–C_3alkoxy, C_1–C_3haloalkyl or C_1–C_3haloalkoxy;

R_8, R_9 and R_{10} are each independently hydrogen, nitro, halogen, cyano, C_1–C_3alkyl, C_1–C_3alkoxy, C_1–C_3haloalkoxy, —COO(C_1–C_3alkyl), NH_2 or $NHCOCH_3$;

R is hydrogen or C_1–C_6alkyl;

R_1 and R_2 are each independently hydrogen, halogen, C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_6haloalkyl, C_1–C_6haloalkoxy, nitro or cyano; and

R_3 is hydrogen, halogen, C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_6haloalkyl, C_1–C_6haloalkoxy, nitro, cyano or the group



wherein

X is O, S, SO or SO_2;

R_4, R_5 and R_6 are each independently hydrogen, halogen, cyano, nitro, C_1–C_6alkyl, C_1–C_6alkoxy, C_1–C_6haloalkyl or C_1–C_6haloalkoxy; or an acid addition salt or metal complex thereof.

14. A method of controlling phytopathogenic microorganisms or of protecting cultivated plants from attack by such microorganisms, which method comprises applying to said plants or to the locus thereof a microbicidally effective amount of a compound according to claim **1**.

4,690,943

ANALGESIC AND ANTIINFLAMMATORY 1,3-DIACYL-2-OXINDOLE COMPOUNDS

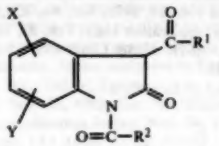
Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 652,372, Sep. 19, 1984, abandoned. This application Jun. 20, 1985, Ser. No. 747,194

Int. Cl.[4] **A61K** *31/40;* **C07D** *209/34*

U.S. Cl. 514—418 **18 Claims**

1. A 1,3-diacyl-2-oxindole compound of the formula:



and the pharmaceutically-acceptable base salts thereof; wherein

X is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons, trifluoromethyl, alkylsulfinyl having 1 to 4 carbons, alkylsulfonyl having 1 to 4 carbons, nitro, phenyl, alkanoyl having 2 to 4 carbons, benzoyl, thenoyl, alkanamido having 2 to 4 carbons, benzamido and N,N-dialkylsulfamoyl having 1 to 3 carbons in each of said alkyls; and Y is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl having 1 to 4 carbons, cycloalkyl having 3 to 7 carbons, alkoxy having 1 to 4 carbons, alkylthio having 1 to 4 carbons and trifluoromethyl;

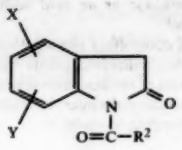
R^1 is selected from the group consisting of alkyl having 1 to 6 carbons, cycloalkyl having 3 to 7 carbons, cycloalkenyl having 4 to 7 carbons, phenyl, substituted phenyl, phenylalkyl having 1 to 3 carbons in said alkyl, (substituted phenyl)alkyl having 1 to 3 carbons in said alkyl, phenoxyalkyl having 1 to 3 carbons in said alkyl, (substituted phenoxy)alkyl having 1 to 3 carbons in said alkyl, (thiophenoxy)alkyl having 1 to 3 carbons in said alkyl and naphthyl;

wherein the substituent on said substituted phenyl, said (substituted phenyl)alkyl and said (substituted phenoxy)alkyl is selected from the group consisting of fluoro, bromo, chloro, alkyl having 1 to 4 carbons, alkoxy having 1 to 4 carbons and trifluoromethyl;

and R^2 is alkyl having from 1 to 5 carbons.

7. An analgesic or antiinflammatory pharmaceutical composition, which comprises a pharmaceutically-acceptable carrier and an effective analgesic or antiinflammatory amount of a 1,3-diacyl-2- oxindole compound according to claim **1**, and wherein the weight ratio of the pharmaceutically-acceptable carrier to the 1,3-diacyl-2-oxindole compound is in the range from 1:4 to 4:1.

8. A compound of the formula



wherein X is selected from the group consisting of hydrogen, 5-fluoro, 5-chloro and 5-trifluoromethyl; Y is selected from the group consisting of hydrogen 6-fluoro, 6-chloro and 6-trifluoromethyl;

and R^2 is alkyl having 1 to 5 carbons;

provided that X and Y are not both hydrogen.

4,690,944

HOMOCYSTEINE THIOLACTONE DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS THEREFROM

Paolo Chiesi, and Vittorino Servadio, both of Parma, Italy, assignors to Chiesi Farmaceutici S.p.A., Parma, Italy

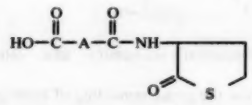
Filed Feb. 19, 1986, Ser. No. 831,159

Claims priority, application Italy, Feb. 22, 1985, 19621 A/85

Int. Cl.[4] A61K *31/38;* **C07D** *409/00, 333/36*

U.S. Cl. 514—445 **6 Claims**

1. A compound of formula I



(I)

wherein —COACO— is the radical from 1,2-, 1,3-, 1,4-cyclohexane dicarboxylic acid, 1,2-, 1,3-cyclopentane dicarboxylic acid or A is 4-cyclohexene-1,2-yl or 1-cyclohexene-1,2-yl; 1-2, 1-3 or 1-4 phenylene; 2-3, 2-4 or 2-5 pyridyl, -bicyclo-[2,2,1]-hepta-5-ene-1,2-diyl; -bicyclo-[2,2,2]-octa-5-ene-1,2-diyl; -7-oxabicyclo-[2,2,1]-hepta-5-ene-1,2-diyl.

4,690,945

PROCESS FOR THE PREPARATION OF 5'-SUBSTITUTED 2-(3'-THIENYL)PROPIONIC ACIDS

Sabastian J. Arechaga; Jose O. O. Granell; Carmen S. Linan; Alfonso P. Vallejo, and Jose A. P. Gabarro, all of Barcelona, Spain, assignors to Laboratorios Madaus Cerafarm, S.A., Barcelona, Spain

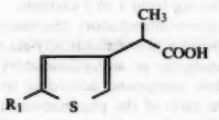
Continuation of Ser. No. 697,431, Feb. 1, 1985, abandoned, which is a continuation of Ser. No. 505,061, Jun. 16, 1983, abandoned, which is a continuation-in-part of Ser. No. 405,655, Aug. 5, 1982, abandoned. This application Jan. 14, 1986, Ser. No. 818,798

Claims priority, application Spain, Aug. 11, 1981, 504690

Int. Cl.[4] A61K *31/38;* **C07D** *333/22, 333/24*

U.S. Cl. 514—448 **5 Claims**

1. 5'-substituted 2(3'-thienyl)propionic acids of the formula



(I)

wherein R_1 is benzyl or alkanoyl, said alkanoyl group having 1 to 6 carbon atoms.

4,690,946

FUNGICIDAL N-PHENYLCARBAMATES

Junya Takahashi; Toshiro Kato, both of Hyogo, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 367,404, Apr. 12, 1982, Pat. No. 4,482,546. This application Oct. 14, 1983, Ser. No. 542,208

Claims priority, application Japan, Apr. 16, 1981, 56-58303; Nov. 6, 1981, 56-178509; May 4, 1982, 57-75768

The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.

Int. Cl.[4] A01N *47/10;* **C07C** *125/065*

U.S. Cl. 514—485 **19 Claims**

1. A N-phenylcarbamate compound selected from the group consisting of:

Isopropyl N-(3-methoxy-4-ethoxy-5-methoxycarbonylphenyl)-carbamate;

Isopropyl N-(3-methoxy-4-ethoxy-5-n-propylphenyl)-carbamate;

Isopropyl N-(3-ethyl-4-ethoxy-5-methoxymethylphenyl)-carbamate;

Isopropyl N-(3-vinyl-4-ethoxy-5-methoxymethylphenyl)-carbamate;

Isopropyl N-(3-bromo-4-ethoxy-5-methoxycarbonylphenyl)-carbamate;

Isopropyl N-[3-chloro-4-(2-chloroethoxy)-5-methoxymethylphenyl]carbamate;

Isopropyl N-[3-chloro-4-(2-bromoethoxy)-5-methoxymethylphenyl]carbamate;

Isopropyl N-(3-bromo-4-ethoxy-5-methoxymethylphenyl)-carbamate;

Isopropyl N-(3-methyl-4-ethoxy-5-methoxycarbonylphenyl)-carbamate;

Isopropyl N-(3-chloro-4-ethoxy-5-methoxycarbonylphenyl)-carbamate;

Isopropyl N-(3-methyl-4-ethoxy-5-propionylphenyl)-carbamate;

Isopropyl N-(3-fluoro-4,5-diethoxyphenyl)carbamate;

Isopropyl N-[3-chloro-4-(2,2,2-trifluoroethoxy)-5-methoxymethylphenyl]carbamate;

Isopropyl N-(3-methoxy-4-ethoxy-5-methoxymethylphenyl)-carbamate;

Isopropyl N-(3-chloro-4-allyloxy-5-methoxymethylphenyl)-carbamate;

Isopropyl N-(3-chloro-4-propargyloxy-5-methoxymethylphenyl)-carbamate; and

Isopropyl N-[3-chloro-4-(2-fluoroethoxy)-5-methoxymethylphenyl]-carbamate.

19. A fungicidal composition which comprises as an active ingredient a fungicidally effective amount of a compound of claim 1.

4,690,947

SYNERGISTIC COMPOSITION FOR THE CONTROL OF ARTHROPODS

Walter M. Zeck, and Donald E. Simonet, both of Vero Beach, Fla., assignors to Mobay Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 632,137, Jul. 18, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 801,454

Int. Cl.[4] A01N *37/34, 37/52, 57/00, 55/04*

U.S. Cl. 514—521 **13 Claims**

1. A synergistic arthropodicidal composition comprising an arthropodicidally effective amount of (A) cyano-(4-fluoro-3-phenoxyphenyl)-methyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate plus (C) N^1-(4-chloro-O-tolyl)-N,N-dimethyl-formamidine, in weight ratio of A:C of about 1:0.2–125.

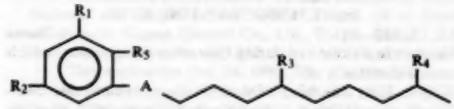
4,690,948

HALOGENATED RESORCYLIC ACID LACTONE DERIVATIVES

Jing-Jong Lu, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Dec. 1, 1986, Ser. No. 936,715
Int. Cl.[4] C07C 65/01
U.S. Cl. 514—544 20 Claims

1. A compound having the formula



wherein A is CH_2—CH_2 or CH=CH; R_1 and R_2, which may be the same or different, are H, OH, OCH_3, OBz, OTHP, or OZ, where Z is an alkyl group having from 2–6 carbon atoms; R_3 is a halogen or OH; R_4 is a halogen; and R_5 is H, CO_2H, or CO_2Z, where Z is CH_3, CH_2OCH_3, CH_2SCH_3, or THP.

4,690,949

THERAPEUTIC DRUG FOR DEMENTIA

Mitsuo Yoshida; Yoshikuni Mizuno, both of Tochigi; Natsue Shimizu, Chiba; Mieko Otsuka; Masakatsu Dobutsu, both of Tochigi; Yuusuke Furukawa, and Yutaka Joshita, both of Tochigi, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

Filed Apr. 29, 1986, Ser. No. 857,239
Claims priority, application Japan, Oct. 31, 1985, 60-245726
Int. Cl.[4] A61K 31/195
U.S. Cl. 514—561 11 Claims

1. A method of treating dementia comprising administering to a patient suffering from dementia an effective amount of DL- or L-threo-3,4-dihydroxyphenylserine or a pharmaceutically acceptable salt thereof.

4,690,950

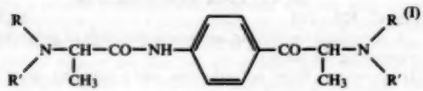
1-[N-(α-AMINO-α-METHYLACETYL)AMINOPHENYL]-2-AMINOPROPANONE DERIVATIVES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons Alford, France

Filed Aug. 16, 1985, Ser. No. 766,636
Claims priority, application France, Aug. 20, 1984, 84 12964
Int. Cl.[4] C07C 103/50; A61K 31/165
U.S. Cl. 514—626 4 Claims

1. A 1-[N-(α-amino-α-methylacetyl)aminophenyl]-2-aminopropanone derivative selected from the group consisting of:

(i) 1-[N-(α-alkylamino-α-methylacetyl)aminophenyl]-2-alkylaminopropanones of the general formula:



(I)

in which R represents $CH(CH_3)_2$ or $C(CH_3)_3$ and R' represents hydrogen; and

(ii) addition salts thereof.

3. A therapeutic composition comprising, in association with a physiologically acceptable excipient, a pharmaceutically effective quantity of a derivative of the formula I according to claim 1, or a non-toxic addition salt thereof.

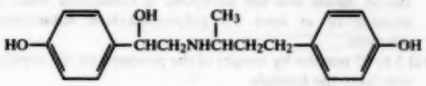
4,690,951

GROWTH PROMOTION

David B. Anderson, Greenfield; Klaus K. Schmiegel, Indianapolis, and Edward L. Veenhuizen, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 628,002, Jul. 5, 1984, abandoned, which is a continuation of Ser. No. 462,587, Jan. 31, 1983, abandoned. This application Dec. 19, 1985, Ser. No. 811,059
Int. Cl.[4] A61K 31/135
U.S. Cl. 514—653 9 Claims

1. A method for promoting the growth of a ruminant comprising administering to the ruminant a growth promoting amount of a compound of the formula



or an acid addition salt thereof.

4,690,952

PHARMACEUTICAL COMPOSITIONS FOR NASAL ADMINISTRATION COMPRISING CALCITONIN AND AN ABSORPTION-PROMOTING SUBSTANCE

Seiya Kagatani; Shunji Hasumi; Takashi Sonobe, and Masayoshi Aruga, all of Shizuoka, Japan, assignors to Yamanouchi Pharmaceutical Co., Inc., Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 800,983
Claims priority, application Japan, Nov. 26, 1984, 59-248898
Int. Cl.[4] A61K 37/26, 37/60
U.S. Cl. 514—808 12 Claims

1. An intranasal pharmaceutical composition of calcitonin comprising (a) a pharmaceutically effective amount of calcitonin and (b) at least one absorption enhancer selected from the group consisting of benzyl alcohol, ethanol, thiamine or a salt thereof, capric acid or a salt thereof, polyethylene glycol 400, pyridoxal or a salt thereof, malic acid or a salt thereof and pyrophosphoric acid or a salt thereof which are contained in a liquid dilution or a carrier suitable for applying to nasal mucous membrane.

4,690,953

METHOD OF FROTHING AQUEOUS IONIC POLYURETHANE DISPERSIONS AND PRODUCTS PRODUCED THEREFROM

Robert B. Orr, Wilmington, and Leon Chicosky, Jr., Newark, both of Del., assignors to Seton Company, Newark, N.J.

Filed Mar. 11, 1986, Ser. No. 838,575
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—65 31 Claims

1. A frothable composition comprising an aqueous ionic polyurethane dispersion and a stearate salt.

4,690,954

HALOGENATED PHOSPHORATE ETHERS WITH FLAME-RETARDANT POLYURETHANES

David J. Wampfler; Donna J. Fielding, both of Midland, and Chester E. Pawloski, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 28, 1986, Ser. No. 856,524
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—107 17 Claims

1. A method for improving a production characteristic of flame-retardant polyurethanes comprising incorporation of a haloether phosphorate flame-retardant compound into a polyurethane under conditions sufficient to improve said characteristic, the haloether phosphorate being in an amount effective to reduce combustibility of the polyurethane.

4,690,955

POLYETHER SILICONE COPOLYMERS WITH MIXED HYDROXY ALKOXY CAPPING FOR STABILIZING HIGH SOLID CONTENT, MOLDED, FLEXIBLE URETHANE FOAM

John A. Kilgour, Putnam Valley, N.Y., and Michael W. Jorgenson, Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1986, Ser. No. 880,295
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—112 24 Claims

1. A polyurethane foam surfactant which comprises:

a single polydialkylsiloxane-polyoxyalkylene copolymer wherein the polydialkylsiloxane contains no more than ten silicon atoms and the backbone is substituted with an average of at least 0.5 polyoxyalkylene substituents wherein

(a) 5 to 95 percent by weight of the pendants on the copolymer have the formula

$$-R(R')_a(R'')_bX$$

wherein R is an alkylene group of 1 to 4 carbons linked to the silicon atom, R′ is an oxyalkylene group of 1 to 4 carbons, R″ is a second oxyalkylene group of 1 to 4 carbons which is different from R′, a plus b is 1 to 15, and X is OR^3 or

$$\begin{matrix} OCR^3 \\ \| \\ O \end{matrix}$$

where R^3 is a monovalent alkyl group of 1 to 4 carbons; and

(b) 95 to 5 percent by weight of the pendants on the copolymer have the formula

$$-R(R')_c(R'')_dOH$$

wherein R is an alkylene organic group of 1 to 4 carbons linked to the silicon atoms, R′ is an oxyalkylene group of 1 to 4 carbons, R″ is a second oxyalkylene group of 1 to 4 carbons which is different from R′, and c plus d is 1 to 10.

4,690,956

PROCESS FOR THE PREPARATION OF GRAFT POLYMER DISPERSIONS AND FLAME-RETARDANT POLYURETHANE FOAMS

Gerhard G. Ramlow, Quebec, Canada; Duane A. Heyman, Monroe, and Oscar M. Grace, Troy, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 426,311, Sep. 29, 1982, Pat. No. 4,550,194, which is a continuation-in-part of Ser. No. 364,336, Apr. 1, 1982, Pat. No. 4,454,255. This application Oct. 28, 1985, Ser. No. 791,873
The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.
Int. Cl.[4] C08K *5/06, 5/10;* C08L *29/02, 51/08*
U.S. Cl. 521—137 20 Claims

1. A stable low viscosity graft polymer dispersion formed by polymerizing in the presence of a reaction moderator and a free radical initiator (a) an ethylenically unsaturated monomer or mixture of monomers provided that in the mixture of monomers the concentration of acrylonitrile or methacrylonitrile is 50 weight percent to 100 weight percent of the weight of monomers, in (b) from about 25 to about 75 weight percent based on the total weight of the dispersion, a polyol mixture comprising (1) a polyoxyalkylene polyether polyol having an equivalent weight from 100 to 10,000, (2) a macromer containing induced fumarate unsaturation consisting essentially of a polyoxyalkylene polyether polyol having an equivalent weight from 100 to 10,000 , wherein the polyol mixture contains from 0.001 to 0.09 mole of induced unsaturation per mole of polyol mixture.

4,690,957

ULTRA-VIOLET RAY CURING TYPE RESIN COMPOSITION

Hirofumi Fujioka, and Masami Inoue, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,165
Int. Cl.[4] C08G *59/62;* C08L *63/00*
U.S. Cl. 522—31 2 Claims

1. An ultra-violet ray curing type resin composition, which consists essentially of:

(A) at least one kind of cationically polymerizable compound containing, as the principal constituent thereof, an epoxy resin having two or more oxirane rings is one molecule thereof;

(B) 0.5 to 20% by weight, with respect to said cationically polymerizable compound, of phenoxy resin having a molecular weight in a range of from 10,000 to 60,000;

(C) 0.5 to 20% by weight, with respect to said cationically polymerizable compound, of polyhydric aliphatic alcohol other than (B) containing two or more hydroxyl groups in its molecule; and

(D) an effective amount of from 0.5 to 10% by weight, with respect to said cationically polymerizable compound, of a photo-initiator capable of isolating a Lewis acid catalyst which is able to initiate polymerization of said cationically polymerizable compound by irradiation of the ultra-violet rays.

4,690,958

ROAD MARKING COMPOSITIONS

Olivier H. V. Lacoste, Brussels, Belgium; Alain De Regel, Paris, France; Hidenori Fujiwara, and Raymond C. C. Yap, both of Yokohama, Japan, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 21, 1986, Ser. No. 832,106
Claims priority, application United Kingdom, Feb. 22, 1985, 85-04683; Aug. 28, 1985, 85-21391
Int. Cl.[4] C09D *3/00, 3/733*
U.S. Cl. 523—172 14 Claims

1. A road marking composition comprising 10 to 30 wt. % of a resin and 90 to 70 wt. % aggregate and, based on the weight of resin 0.1 to 5 wt. % of a substantially saturated dicarboxylic acid, anhydride or ester, substituted with at least one hydrogen-and carbon containing group of at least 30 carbon atoms, wherein said resin comprises a petroleum resin, a rosin derivative, a polyterpene, or derivatives thereof.

4,690,959

POLYETHYLENE COMPOSITE COMPRISING A COUPLING AGENT COMPOSITION COMPRISING FUMARIC ACID AND AN AMINOSILANE

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 9, 1986, Ser. No. 861,384
Int. Cl.[4] C08K *9/06, 3/40, 5/54*
U.S. Cl. 523—213 8 Claims

1. A method for making composite materials of polyethylene comprising the steps of;

(I) intermixing filler, polyethylene, and a coupling agent composition comprised of

(A) a diamine functional silane of the general formula

$$(RO)_3SiR'NH(CH_2)_2NHR''$$

where R denotes an alkyl radical with 1 to 6 carbon atoms or an alkoxyalkyl radical with 2 to 8 carbon atoms, R′ denotes an alkylene radical with 1 to 4 carbon atoms, R″ denotes a hydrogen atom, an alkyl radical with 1 to 6

carbons, or an alkenylarylalkyl radical with 8 to 10 carbon atoms.

(B) fumaric acid; and

(C) a nonreactive solvent where the mole ratio of the fumaric acid (B) to the diamine functional silane (A) is between 1.0 and 1.4.

4,690,960

VIBRATION DAMPING MATERIAL

Fumio Yamauchi, Tokyo; Tsutomu Tohara, Kanagawa; Shigeo Nakano, and Shigeo Emoto, both of Tokyo, all of Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 467,042, Feb. 16, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,354

Claims priority, application Japan, Jan. 14, 1981, 56-4266; Mar. 26, 1981, 56-44590; Apr. 10, 1981, 56-54043; Apr. 28, 1981, 56-64737; Jan. 22, 1982, 57-7168; Feb. 16, 1982, 57-23222; Mar. 4, 1982, 57-30556[U]

Int. Cl.[4] B23P *11/00*; F16M *11/00*; C08K *3/22*

U.S. Cl. 523—442 **12 Claims**

1. A system for isolating vibrations, comprising a functional apparatus to be operated where vibration is damped, and a bed on which said functional apparatus is mounted, said bed made by usage of a composition essentially consisting of 40 to 90 weight percent of iron oxide particles of 0.1 to 100 μm in size and 60 to 10 weight percent of resin, in which said bed includes honeycomb core made of metal.

4,690,961

SEALANT COMPOSITION

R. Clay Cole, Duncan, and Bobby K. Bowles, Comanche, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 8, 1986, Ser. No. 916,576

Int. Cl.[4] C08K *3/26, 3/08*

U.S. Cl. 523—440 **12 Claims**

1. A sealant composition comprising a hardenable liquid resin which can be caused to set into a hard mass, comprisng the condensation product of epichlorohydrin and bisphenol-A having a weight per expoxide of about 175 to about 195 diluted with butylglycidyl ether, a powdered inert filler dispersed in said resin, and a dispersing and thixotropy imparting agent comprised of precipitated calcium carbonate present in said composition in an amount in the range of about 10% to about 50% by weight of said composition.

4,690,962

COMPOSITION, COATED ARTICLE AND METHOD OF COATING

Roger J. Clark, Underhill, Vt.; James Economy, San Jose, Calif.; Mary A. Flandera, Endicott, N.Y.; John R. Susko, and Robin A. Wheater, both of Owego, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 628,980, Jul. 12, 1984, Pat. No. 4,592,944, which is a continuation of Ser. No. 381,485, May 24, 1982, abandoned. This application Apr. 7, 1986, Ser. No. 835,083

Int. Cl.[4] C08K *5/34, 5/00*; C08L *49/00*

U.S. Cl. 524—94 **19 Claims**

1. A composition capable of forming a continuous film comprising a soluble polymerizable oligomer wherein said oligomer is obtained from 1,3,5-triethynylbenzene, has a molecular weight of about 400 to about 2000, at least 60% of the acetylenic groups thereof are diacetylenic groups, each molecule of the oligomer contains at least two acetylenic groups, and the oligomer contains up to 20% by weight ethynyl content; and a plasticizer selected from the group of diphenyldiacetylene, diphenylbutadiene, diphenylether, phenyltriethynyl silane, 4,4'diethynyldiphenylether, and mixtures thereof; or a toughening agent selected from the group of cyclized poly(arylacetylene) polymer, aromatic diphenylether, acrylonitrile polymer, polyimides, polyquinoxalines, polyesters, or polysilicones, and mixtures thereof; or both.

4,690,963

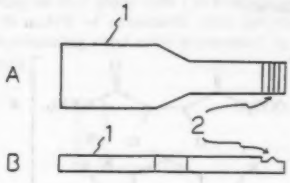
TARTRATE-BASED LIGHT STABILIZERS FOR PLASTICS

Richard V. Nelson, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 786,797, Oct. 11, 1985, abandoned. This application Sep. 2, 1986, Ser. No. 902,781

Int. Cl.[4] C07D *401/12, 401/14*; C08K *5/34*

U.S. Cl. 524—98 **12 Claims**



1. A compound of the formula I

wherein n has a value of 1 to 15,

when n is 1, p and q can be 1 or 0, when n is greater than 1, p is 1, while q may be 1 or 0;

R′ is selected from hydrogen and an alkyl group of 1 to 5 carbon atoms;

R^2 is selected from hydrogen, oxyl, hydroxyl, a methylene-linked alkyl group from 1 to 18 carbon atoms, an alkanoyl group having 2 to 18 carbon atoms, an alkenyl group of 3 to 4 carbon atoms, an alkenoyl group having 3 to 6 carbon atoms, an alkynyl group having 3 to 6 carbon atoms, a cyanomethyl group, a 2,3-epoxypropyl group, an aralkyl group of 7 to 15 carbon atoms, a group $—CH_2CH(OR^5)—R^6$, and a group of the formula

$$—(CH_2)_m—\overset{O}{\overset{\|}{C}}—Z$$

where Z is a group selected from $—OR^7$ and $—N(R^8(R^9)$ and m is either 1 or 0 and when m is 0, Z is a group —C(O)—OR^{10} and —A—C(O)—R^{11};

R^3 and R^4, same or different are selected from an alkyl group of 1 to 18 carbom atoms such as R^2, hydrogen and a group of formula II;

R^5 is selected from hydrogen, a methylene-linked alkyl group from 1 to 18 carbon atoms, an alkanoyl group having 2 to 18 carbon atoms, an alkenyl group of 3 to 4 carbon atoms, an alkenoyl group having 3 to 6 carbon atoms, an alkynyl group having 3 to 6 carbon atoms, a cyanomethyl group, a 2,3-epoxypropyl group, an aralkyl group of 7 to 15 carbon atoms;

R^6 is selected from hydrogen, an alkyl group of 1 to 16 carbon atoms such as those of R^2, and phenyl;

R^7 is selected from an alkyl group of 1 to 18 carbon atoms, a cycloalkyl group of 5 to 12 carbon atoms alkyl, benzyl, phenyl, and a group of formula III wherein R′ and R^2 are as described above;

R^8 and R^9, same or different, are selected from hydrogen, an alkyl group having 1 to 8 carbon atoms, alkyl group having 5 to 12 carbon atoms such as those of R^7, aryl groups having 6 to 10 carbon atoms and aralyl groups having 7 to 15 carbon atoms and R^8 and R^9 together with the nitrogen atom to which they are attached can form a 5 to 7-membered ring selected from the group consisting of pyrrolidine, piperidine and homopiperidine;

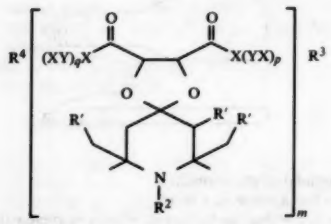
R^{10} is selected from an unsubstituted alkyl group of 1 to 18 carbon atoms, phenyl and benzyl;

A is selected from an alkylene group of 1 to 12 carbon atoms, phenylene and a group —NH—R^{12}—NH—where R^{12} is

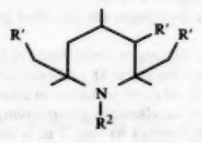
selected from an alkylene group of 2 to 18 carbon atoms, either straight chained or branched a cycloalkylene group having 5 to 18 carbon atoms, an arylene group having 6 to 18 carbon atoms, and an aralkylene group having 7 to 18 carbon atoms and R^{11} is a group of the formula III;

X is either —O— or —NR^{13} where R^{13} is selected from hydrogen or an alkyl group of 1 to 8 carbon atoms;

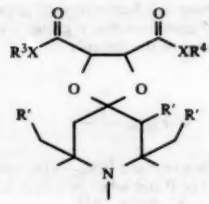
Y is a divalent alkylene group having 2–20 carbon atoms, wherein the alkylene may be interrupted by —O—, —S— or —NR^{13}—, a cycloalkylene group of 6–12 carbon atoms, dialkanylcycloalkane, a phenylene group and an aralkylene group having 8 to 15 carbon atoms whereinsaid formulas are:



I



II



III

9. A synthetic polymer composition stabilized against light induced deterioration comprising an organic polymer normally subjected to deterioration by light, and from 0.01–5% by weight of a compound of the general formula of claim 1.

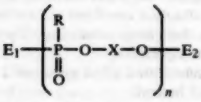
4,690,964

THERMOPLASTIC POLYURETHANE COMPOSITIONS HAVING IMPROVED FLAME RESISTANCE

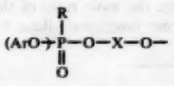
Manfred Schmidt, Krefeld, Fed. Rep. of Germany, and Robert P. Yeater, Moundsville, W. Va., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Jan. 26, 1983, Ser. No. 461,063
Int. Cl.[4] C08K *5/53*; C08F *283/00*
U.S. Cl. 524—125 **6 Claims**

1. A homogeneous thermoplastic molding composition comprising (i) a thermoplastic polyurethane and (ii) an oligomeric polyalkylphosphonate characterized in that it contains structural units conforming to



wherein R denotes any of C_1–C_{12} alkyl, C_2–C_{12} alkenyl, C_6–C_{30} cycloalkyl or cycloalkenyl, C_7–C_{30} arylalkyl or C_8–C_{30} arylalkenyl, E_1 denotes



and E_2 denotes

where Ar denotes phenyl or cresyl and n is between 5 and 22 and X is the residue of a diphenol of the type

HO—X—OH

wherein X has 6 to 30 carbon atoms, said composition being further characterized in that said (i) is related by weight to said (ii) in a ratio of between 90:10 and 60:40.

4,690,965

RUBBER COMPOSITIONS HAVING IMPROVED REINFORCING PROPERTIES AND LOW HEAT BUILD-UP

Yasushi Hirata, Sayama; Hitoshi Kondo, Higashimurayama; Goro Yokoyama, Tokyo, and Masaki Ohara, Wako, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 2, 1986, Ser. No. 858,985
Claims priority, application Japan, May 2, 1985, 60-93569
Int. Cl.[4] C08K *5/32*
U.S. Cl. 524—236 **2 Claims**

1. A rubber composition having improved reinforcing properties, comprising 20–150 parts by weight of carbon black having an iodine adsorption value (IA) of not less than 60 mg/g and dibutyl phthalate oil absorption (DBP) of not less than 75 ml/100 g and 0.1–3 parts by weight of at least one nitrosoaniline compound selected from the group consisting of p-nitroso-N-methylaniline, p-nitroso-N-ethylaniline and p-nitroso-N-propylaniline, based on 100 parts by weight of natural rubber and/or synthetic diene rubber.

4,690,966

HEAT ACTIVATED SILICON-BASED ADHESIVE

Anthony V. Rende, Jr., Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Feb. 26, 1987, Ser. No. 19,179
Int. Cl.[4] C08K *5/54*
U.S. Cl. 524—264 **8 Claims**

1. An adhesive composition comprising

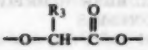
(i) about 2.5 to 70% by weight of an olefin organosilane

(ii) about 0.25 to 32% by weight water; and

(iii) about 0.25 to 20% by weight on a dry basis of aluminum zirconium metallo-organic complex of chelated aluminum moiety, an organofunctional ligand and a zirconium oxyhalide, the organofunctional ligand being complexed with and chemically bound to the chelated aluminum moiety and the zirconium;

said aluminum moiety having the formula:

$Al_2(OR_1O)_aA_bB_c$ wherein A or B is hydroxy or halogen and a, b and c are numerical values such that $2a+b+c=6$, and (OR_1O) is an alpha, beta or alpha, gamma glycol group in which R_1 is an alkyl group having 1 to 6 carbon atoms or an alpha-hydroxy carboxylic acid residue having the formula:



wherein R_3 is H or an alkyl group having 1 to 4 carbon atoms;

said organofunctional ligand is an aminofunctional carboxylic acid having 2 to 18 carbon atoms or a mercaptofunctional carboxylic acid having 2 to 18 carbon atoms; and

said zirconium oxyhalide moiety has the formula:

ZrA_dB_e

wherein A and B are as above defined and d and e are numerical values such that $d+e=4$; the molar ratio of chelated aluminum moiety to zirconium oxyhalide moiety being from 1.5 to 10, and the molar ratio of organofunctional ligand to total metal being from about 0.05 to 2.

4,690,967

HEAT-CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Robert LaGarde, Feyzin, and Noel Bouverot, Saint Symphorien d'Ozon, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Dec. 21, 1984, Ser. No. 685,148

Claims priority, application France, Dec. 21, 1983, 83 20448

Int. Cl.[4] C08K 5/54, 3/36

U.S. Cl. 524—266 **14 Claims**

1. A heat-curable organopolysiloxane composition of matter, comprising (A) a major amount of a diorganopolysiloxane gum having a viscosity greater than 1,000,000 mPa.s at 25° C.; (B) a reinforcing amount of a reinforcing filler therefor; (D) a catalytic amount of an organic peroxide; and at least three of the following four constituents (E), (F), (G) and (H): (E) a minor amount of an organohydrogenopolysiloxane; (F) a minor amount of an organofluorinated polymer; (G) a minor amount of an organosiloxane compound containing at least one acroyloxyalkyl or methacroyloxyalkyl group covalently bonded to a silicon atom thereof; and (H) a minor amount of a boron compound.

4,690,968

FLUOROOLEFIN COPOLYMER, PROCESS FOR PRODUCTION THEREOF AND COMPOSITION CONTAINING SAID COPOLYMER

Tomomasa Mitani, Izumi, and Ichiro Mihata, Izumiohtsu, both of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 795,115, Nov. 5, 1985, Pat. No. 4,640,966. This application Oct. 22, 1986, Ser. No. 921,682

Claims priority, application Japan, Nov. 7, 1984, 59-234327; Dec. 18, 1984, 59-266831

Int. Cl.[4] C08K 5/10; C08L 27/12; C08F 8/00

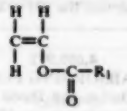
U.S. Cl. 524—315 **14 Claims**

1. A coating composition comprising a fluoroolefin copolymer having an inherent viscosity of 0.05 to 2.0 dl/g and composed of

(I) 10 to 70 mole% of monomeric units derived from a fluoroolefin represented by the general formula

wherein X is H, Cl, F, CF_3, OCF_3 or OC_3F_7,

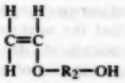
(II) 5 to 60 mole% of monomeric units derived from a vinyl carboxylate represented by the general formula



wherein R_1 represents an aliphatic, aromatic or alicyclic hydrocarbon group having 1 to 17 carbon atoms,

(III) 5 to 70 mole% of monomeric units derived from a vinyl ether having an alkyl group with 1 to 8 carbon atoms, and

(IV) 0 to 30 mole% of monomeric units derived from a hydroxyl-containing vinyl ether represented by the general formula



wherein R_2 represents an alkylene group having 1 to 6 carbon atoms;

and an organic solvent.

4,690,969

POLYPHENYLENE SULFIDE RESIN COMPOSITIONS AND THEIR MOLDINGS

Yoshio Takezawa, and Tatsuo Akatsu, both of Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

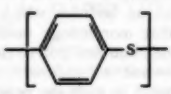
Filed May 13, 1986, Ser. No. 862,751

Claims priority, application Japan, May 23, 1985, 60-111219

Int. Cl.[4] C08K 3/16

U.S. Cl. 524—413 **7 Claims**

1. A polyphenylene sulfide resin composition comprising at least 90 mol % polyphenylene sulfide having a unit represented by the formula:



(I)

as main component and halogenized copper, the copper content of which is 0.03–3% by weight based on the weight of the polyphenylene sulfide.

4,690,970

THERMOPLASTIC COMPOSITIONS BASED ON POLYPHENYLENE ETHERS, IMPACT-RESISTANT STYRENE POLYMERS, AND PULVERULENT, FILLER-CONTAINING RUBBER; AND METHOD FOR MANUFACTURING SUCH COMPOSITIONS

Roland Feinauer, and Hans Jadamus, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 18, 1985, Ser. No. 746,040

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424219

Int. Cl.[4] C08K 3/36, 3/04

U.S. Cl. 524—504 **19 Claims**

1. A thermoplastic molding composition comprising a polyphenylene ether, an impact-resistant styrene polymer and a pulverulent, filler-containing styrene-butadiene rubber, wherein the pulverulent, filler-containing rubber is prepared by (a) combining the rubber component in dissolved form with an aqueous suspension of a filler, wherein the suspension comprises a water-soluble aluminum salt and water glass, and has a pH of from 3.0 to 3.7, and (b) precipitating a pulverulent, filler

containing rubber by adding mineral acid to the aqueous suspension mixture to maintain the pH at from 3.0 to 3.7.

4,690,971

WATER ABSORBING POLYMERS

Peter Flesher; John Clarke, and David Marshall, all of West Yorkshire, England, assignors to Allied Colloids Limited, Great Britain

Filed Mar. 3, 1986, Ser. No. 835,602

Claims priority, application United Kingdom, Mar. 5, 1985, 8505632; Dec. 13, 1985, 8530784

Int. Cl.[4] C08L *33/26*

U.S. Cl. 524—555 16 Claims

1. A process in which a wet particulate mass which is not crumbly at a predetermined temperature is mixed with water absorbent polymer particles that absorb free water from the mass and the resultant mixture is crumbled at the said temperature characterized in that the mixture is free of polymeric binder, the polymer particles have a dry size of 50 micrometers to 3 millimeters and a gel capacity of at least 25, the polymer particles are substantially non-sticky when swollen with water, and the polymer is a non-film forming, wholly synthetic, polymer of (a) 5 to 100 mole percent acrylic acid (as free acid or water soluble salt), (b) 0 to 95 mole percent acrylamide, (c) 0 to 50 mole percent other monoethylenically unsaturated monomers selected from non-ionic and anionic monomers and (d) 10 to 10,000 ppm (by weight total monomers) cross-linking agent.

4,690,972

METHOD OF PRODUCING POLY(ARYLENE SULFIDE) COMPOSITIONS AND ARTICLES MADE THEREFROM

Timothy W. Johnson; William H. Beever; James E. O'Connor, and Jennings P. Blackwell, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 4, 1986, Ser. No. 848,436

Int. Cl.[4] C08K *3/20*

U.S. Cl. 524—609 43 Claims

1. A method comprising the steps of:

(a) blending a first poly(arylene sulfide)-containing composition together with an additive which is effective to achieve a crystalline morphology modification of said poly(arylene sulfide), said first poly(arylene sulfide)-containing composition and said additive forming a mixture;

(b) heating said mixture to melt the poly(arylene sulfide) present in the poly(arylene sulfide)-containing composition;

(c) further heating said mixture to at least 15° C. above the temperature employed in step (b); and

(d) cooling said mixture at a rate of less than about 50° C. per minute thus forming a second poly(arylene sulfide)-containing composition.

4,690,973

PRODUCTION PROCESS OF AN ANTITHROMBOGENIC AND ANTIADHESIVE MATERIAL FOR MEDICAL USE

Yasuharu Noishiki, Tottori; Kazuhiko Kodaira, Mitaka; Masayasu Furuse, Sagamihara; Teruo Miyata, Tokyo; Takeaki Miyamoto, Nagaokakyo, and Hiraku Ito, Kyoto, all of Japan, assignors to Koken Company Limited, Tokyo, Japan

Filed Jul. 15, 1986, Ser. No. 885,782

Claims priority, application Japan, Jul. 29, 1985, 60-165990

Int. Cl.[4] C08H *1/06;* C08L *89/04, 89/06*

U.S. Cl. 525—54.1 4 Claims

1. A production process of an antithrombogenic and antiadhesive material for medical use, characterized by subjecting glycidyltrialkylammonium halide to the reaction with a material comprising only collagen or collagen and other components in order to introduce a cationic functional group in collagen molecules of said material and then subjecting heparin to the ionic combination with said cationic functional group introduced.

4,690,974

METHOD FOR PRODUCING RUBBER MODIFIED THERMOPLASTIC RESINS

Teruhiko Sugimori, Otake; Noriyuki Tajiri, Toyohashi, and Yutaro Fukuda, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 20, 1986, Ser. No. 864,868

Claims priority, application Japan, May 21, 1985, 60-109102; May 22, 1985, 60-110989

Int. Cl.[4] C08L *51/00*

U.S. Cl. 525—64 8 Claims

1. A method for producing rubber modified thermoplastic resin which comprises (a) removing an aqueous phase from a two-phase mixture comprising a graft rubber polymer latex (1) obtained by graft polymerization of a vinyl monomer on a rubber latex, a thermoplastic resin (2), which is soluble in an organic agent, an organic agent in an amount of 0.1 to 6 times the weight of all the pblymers (3) which is capable of dissolving said thermoplastic resing (2) and has a solubility in water of 5% by weight or less at 25° C., wherein the said organic agent comprises petroleum ether, benzene, toluene, xylene, ethylbenzene, p-cymene, tetralin, methylene chloride, chloroform, carbon tetrachloride, trichlene, cholrlbenzene, epichlorlhydrin, methyl-n-propyl ketone, acetophenone, n-propyl acetate, n-butyl acetate 1-nitropropane, styrene, methyl methacrylate, or α-methyl styrene, and a coagulant in an amount of 10% by weight or less of said graft rubber polymer which can coagulate said latex and then (b) removing the said organic agent and the remaining water from the remaining organic phase by a thermal means.

4,690,975

METHOD FOR PRODUCING RUBBER MODIFIED THERMOPLASTIC RESINS

Teruhiko Sugimori, Otake; Noriyuki Tajiri, Toyohashi, and Yutaro Fukuda, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 27, 1986, Ser. No. 867,204

Claims priority, application Japan, May 28, 1985, 60-114871; May 30, 1985, 60-117056

Int. Cl.[4] C08L *51/00*

U.S. Cl. 525—64 7 Claims

1. A method for producing a rubber modified thermoplastic resin which comprises removing an aqueous phase from a two-phase mixture comprising a graft rubber polymer latex (1) obtained by graft polymerization of vinyl monomer on a rubber latex, a thermoplastic resin (2) which is soluble in an organic agent, and the organic agent in an amount of 0.2 to 6 times the weight of all the polymers (3) which is capable of dissolving said thermoplastic resin (2) and has a solubility in water of 5 to 50% by weight at 25° C., wherein the said organic agent comprises methyl ethyl ketone, methyl acetate, ethyl acetate, diethyl cellosolve, ethyl cellosolve acetate, furfural, trioxan, methyl formate, ethyl formate, propylene oxide, 2-pentanol, 2-butanol, isobutanol, n-butanol, acrylonitrile, or a mixed agent comprising a first agent and a second agent, wherein the first agent comprises acetone, methanol, ethanol, n-propanol, iso-propanol, formic acid, acetic acid, propionic acid, dioxane, tetrahydrofuran, N,N-dimethylformamide, N,N-dimethylacetamide, N,N-dimethylsulfoxide, ethyl cellosolve, or phenol, and wherein the second agent comprises toluene, xylene, benzene, chloroform, methylene chloride, dimethyl ether, isopropyl ether, tetrachloroethane, ethylbenzene, styrene, or methyl methacrylate; and then removing said organic agent and remaining water from the remaining organic phase by a thermal means.

4,690,976

BLENDS OF OLEFINIC AND MONOVINYLIDENE AROMATIC POLYMERS

Jerry L. Hahnfeld, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 519,438, Aug. 1, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 820,505

Int. Cl.[4] C08L *51/04, 51/06, 23/06, 23/10*

U.S. Cl. 525—70 22 Claims

1. A polymer blend composition comprising:

(a) at least about 20 weight percent olefin polymer, said weight percent being based on the weight of components (a), (b) and (c);

(b) at least about 5 weight percent monovinylidene aromatic polymer based on the weight of components (a), (b) and (c); and

(c) a compatibilizing amount of a monovinylidene aromatic polymer-grafted α-olefin copolymer provided that the α-olefin copolymer of component (c) is different from and nonmiscible with the olefin polymer of component (a) and comprises a polymer of an α-olefin monomer having from 2 to 4 carbon atoms and at least one additional different polymerizable alpha-olefin monomer having from 3 to 16 carbon atoms.

4,690,977

VINYL CHLORIDE POLYMER COMPOSITION

Hideki Hosoi, Kobe; Toshihiko Hasegawa, Hyogo, and Taizo Aoyama, Himeji, all of Japan, assignors to Kaneg.fuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 721,001, Apr. 8, 1985, Pat. No. 4,645,795. This application Aug. 20, 1986, Ser. No. 897,968

Claims priority, application Japan, Apr. 12, 1984, 59-74630

Int. Cl.[4] C08L *51/04, 57/08*

U.S. Cl. 525—83 5 Claims

1. A vinyl chloride polymer composition comprising:

(A) 3 to 50 parts by weight of a grafted copolymer, and

(B) 97 to 50 parts by weight of a vinyl chloride polymer, the total amount of said copolymer (A) and said polymer (B) being 100 parts by weight;

said grafted copolymer (A) comprising:

(1) 50 to 80 parts by weight of a rubber copolymer, and

(2) 50 to 20 parts by weight of a grafting monomer graft-polymerized onto said component (1), the total amount of said component (1) and said component (2) being 100 parts by weight;

said rubber copolymer component (1) comprising:

(a) 60 to 90% by weight of a core rubber copolymer comprising 99 to 85% by weight of an alkyl acrylate having an alkyl group of 2 to 8 carbon atoms, 1 to 15% by weight of a conjugated diolefin and 0 to 5% by weight of a polyfunctional cross-linking agent, and

(b) 40 to 10% by weight of a surface rubber copolymer comprising 98 to 70% by weight of an alkyl acrylate having an alkyl group of 2 to 8 carbon atoms, 2 to 30% by weight of a conjugated diolefin and 0 to 5% by weight of a polyfunctional cross-linking agent and being obtained by polymerizing said component (a) to give said core rubber copolymer and then polymerizing said surface rubber copolymer component (b) in the presence of said core rubber copolymer (a), and the ratio of said conjugated diolefin to said alkyl acrylate in said surface rubber copolymer (b) being larger than the ratio of said conjugated diolefin to said alkyl acrylate in said core rubber copolymer (a);

and said grafting monomer component (2) comprising:

(i) 30 to 95% by weight of methyl methacrylate, and

(ii) 70 to 5% by weight of at least one monomer selected from the group consisting of an unsaturated nitrile, an aromatic vinyl compound, an alkyl acrylate having an alkyl group of 1 to 8 carbon atoms and an alkyl methacrylate having an alkyl group of 2 to 4 carbon atoms, and being graft-polymerized onto said rubber copolymer (1) by conducting a graft-polymerization in two stages.

4,690,978

THERMOPLASTIC COMPOSITIONS BASED ON POLYPHENYLENE ETHERS AND STYRENE-BUTADIENE POLYMERS PRODUCED BY EMULSION POLYMERIZATION

Hans Jadamus, Marl; Wilfried Ribbing, Dorsten, and Roland Feinauer, Marl, all of Fed. Rep. of Germany, assignors to Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Oct. 28, 1985, Ser. No. 792,283

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1984, 3442274

Int. Cl.[4] C08F *36/06*; C08L *9/06, 71/04*

U.S. Cl. 525—152 12 Claims

1. A thermoplastic composition, comprising:

(A) a polyphenylene ether in an amount of from 15 to 95 parts by weight;

(C) a styrene butadiene rubber, obtained by emulsion polymerization, in an amount of from 3 to 15 parts by weight; and

(D) a styrene-butadiene copolymer prepared by emulsion polymerization, wherein the said styrene is incorporated in the copolymer in an amount of >80 wt. %, the said styrene-butadiene copolymer being present in an amount of from 3 to 15 parts by weight.

4,690,979

TERMINALLY FUNCTIONALIZED POLY(ALLOOCIMENE)

Richard L. Veazey, East Windsor, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Nov. 5, 1986, Ser. No. 927,230

Int. Cl.[4] C08F *8/42, 8/34*

U.S. Cl. 525—153 14 Claims

1. The functionalized polymer prepared from the reaction of an electrophilic reagent and anionically active poly(alloocimene) comprised of a mixture of greater than 50 weight percent 2,3- and 6,7-poly(alloocimene) and less than 50 weight percent 4,7-poly(alloocimene) residues in the polymer chain thereof.

4,690,980

ACRYLIC MODIFIED POLYMERS

Debra L. Singer, Pittsburgh; William J. Birkmeyer, Oakmont; Rostyslaw Dowbenko, Gibsonia, and Charles M. Kania, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 755,995, Jul. 17, 1985, abandoned. This application May 20, 1986, Ser. No. 864,579

Int. Cl.[4] C08F *265/02*

U.S. Cl. 525—286 19 Claims

1. A liquid, ungelled composition of matter which comprises a graft copolymer prepared by the free radical initiated vinyl addition polymerization in an organic medium of a vinyl monomer component which contains at least 0.5 weight percent of an epoxy group containing vinyl monomer in the presence of an acid group containing polymer having an acid value greater than 10 mg KOH/g, at least one means of graft formation being the condensation reaction between the acid groups of the acid group containing polymer and the epoxy groups of the vinyl monomer component.

4,690,981

IONOMERS HAVING IMPROVED LOW TEMPERATURE PROPERTIES

Robert J. Statz, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 477,512, Mar. 21, 1983, abandoned, which is a continuation-in-part of Ser. No. 453,951, Dec. 28, 1982, abandoned. This application Mar. 20, 1984, Ser. No. 591,485

Int. Cl.[4] C08F 22/00

U.S. Cl. 525—329.6 5 Claims

1. Ionic copolymer of ethylene, unsaturated carboxylic acid and at least one softening comonomer said ionic copolymer having improved low temperature properties, wherein the unsaturated carboxylic acid is selected from the group consisting of acrylic acid, methacrylic acid, maleic acid, fumaric acid, itaconic acid, and half esters of maleic, fumaric and itaconic acids, and the softening comonomer is selected from the group consisting of n-propyl acrylate, n-butyl acrylate, 2-ethylhexyl acrylate, and 2-methoxyethyl acrylate said copolymer containing from about 10 to about 87% by weight of ethylene, from about 3 to about 30% by weight of unsaturated acid and from about 10 to about 60% by weight of said softening comonomer, said copolymer having from about 3 to about 90% of the carboxylic acid groups ionized by neutralization with metal ion selected from the group consisting of sodium, potassium, zinc, calcium, magnesium, lithium, aluminum, nickel and chromium, said copolymer being characterized by a low level of chain branching of up to about 5.5 chain branches/1000 backbone methylene units, said copolymer being further characterized by having a flex durablity which is improved by a factor of at least about 500% when compared with a polymer of the same composition as said ionic copolymer, but having about 8.0 short chain branches per 1000 backbone methylene units.

4,690,982

EPOXIDIZED POLY(ALLOOCIMENE)

Richard L. Veazey, East Windsor, N.J., and Kathryn S. Hayes, Norristown, Pa., assignors to Union Camp Corporation, Wayne, N.J.

Filed Nov. 5, 1986, Ser. No. 927,232

Int. Cl.[4] C08F 8/08

U.S. Cl. 525—331.9 3 Claims

1. Epoxidized 2,3- and 6,7-poly(alloocimene).

4,690,983

HYDROGENATED POLY(ALLOOCIMENE)

Richard L. Veazey, East Windsor, N.J., and Kathryn S. Hayes, Norristown, Pa., assignors to Union Camp Corporation, Wayne, N.J.

Filed Nov. 5, 1986, Ser. No. 927,231

Int. Cl.[4] C08F 8/04

U.S. Cl. 525—331.9 5 Claims

1. Hydrogenated 2,3- and 6,7-poly(alloocimene).

4,690,984

METAL COMPLEXES OF POLY(ALLOOCIMENE)

Richard L. Veazey, East Windsor, and Mark S. Pavlin, Lawrenceville, both of N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Nov. 25, 1986, Ser. No. 934,729

Int. Cl.[4] C08F 8/42

U.S. Cl. 525—332.3 6 Claims

1. A metal complex of 2,3- and 6,7-poly(alloocimene) and a metallic compound.

4,690,985

STAR/COMB-BRANCHED POLYAMINE

Donald A. Tomalia, and Mark J. Hall, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 683,299, Dec. 18, 1984, Pat. No. 4,599,400. This application Mar. 7, 1986, Ser. No. 837,126

Int. Cl.[4] C08G 69/00, 73/02

U.S. Cl. 525—419 4 Claims

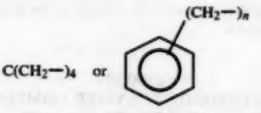
2. A star/comb-branched polyamine represented by the formula

$$Z[NH-C(R^2)_2(CH_2)_x C(R^2)_2)_m]_nR$$

wherein Z is the residue of a core compound, each R^2 is independently hydrogen or hydrocarbyl, R is a chain-terminating group, m is a whole number from 2 to 1000, x is 0 or 1 and n is a whole number from 3 to 100.

3. The polyamine of claim 2 wherein Z is an n-valent hydrocarbon radical, each R^2 is hydrogen, x is 0 and n is a whole number in the range from 3 to 20.

4. The polyamine of claim 3 wherein Z is



wherein n is from 3 to 6 and R is hydrogen or alkyl.

4,690,986

IMPACT-RESISTANT THERMOPLASTIC POLYORGANOSILOXANE-BASED GRAFT COPOLYMER AND PROCESS FOR PRODUCING SAME

Isao Sasaki, Hiroshima; Akira Yanagase; Yasunori Kawachi, both of Otake; Tetsuya Mayuzumi, Kawagoe; Toshio Oba, Annaka, and Fumio Okada, Takasaki, all of Japan, assignors to Mitsubishi Rayon Co., Ltd. and Shin-Etsu, Chemical Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 726,462, Apr. 24, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 904,463

Claims priority, application Japan, May 30, 1984, 59-108492

Int. Cl.[4] C08F 283/12

U.S. Cl. 525—479 18 Claims

1. An impact-resistant, thermoplastic polyorganosiloxane-based graft copolymer produced by the emulsion graft polymerization of at least one vinyl monomer on an emulsion-polymerized polyorganosiloxane which consists of

90 to 99.8 mole % of an organosiloxane unit represented by the formula

$$R'_2SiO_{2/2} \quad (I)$$

wherein R′ is the same or different and denotes methyl, ethyl, propyl, or phenyl,

0.1 to 10 mole % of a unit derived from a graft-linking agent, said unit being represented by the formula

$$CH_2=\underset{\displaystyle CH_3}{\overset{|}{C}}-COO+CH_2\rightarrow_p SiR_n^2O_{(3-n)/2} \quad (II)$$

wherein; R^2 denotes methyl, ethyl, propyl, or phenyl; n denotes a number of 0, 1, and 2; and p denotes a number of 1 to 6, and

0.1 to 10 mole % of a unit derived from a tetrafunctional silane crosslinking agent, said unit being represented by the formula

$$SiO_{4/2} \quad (III),$$

said polyorganosiloxane showing a degree of swelling of 5 to 15 in toluene, and

said graft copolymer containing said polyorganosiloxane in an amount of 10 to 70% by weight.

4,690,987

ACTIVATION ENERGY-CURABLE RESIN COMPOSITION

Shigeru Sakakibara, Ichihara; Shunji Arimoto, Narashino; Hidenobu Ishikawa, Ichihara, and Osamu Maruyama, Chiba, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,254

Claims priority, application Japan, May 28, 1984, 59-106530

Int. Cl.[4] C08G 8/22, 8/30; C08L 63/04

U.S. Cl. 525—502 **13 Claims**

1. An activation energy-curable resin composition comprising as an essential ingredient a resin obtained by reacting (a) the reaction product of a novolac epoxy compound and an unsaturated monocarboxylic acid with (b) the reaction product of a diisocyanate and a polyacrylate or polymechacrylate ester of a polyol wherein the final structure has one hydroxyl group for each molecule.

4,690,988

POLYMER-MODIFIED VINYLIZED EPOXY RESINS

Dwight K. Hoffman, Midland, Mich.; Michael G. Stevens, Worthington, Ohio, and Virginia B. Messick, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 22, 1985, Ser. No. 693,411

Int. Cl.[4] C08G 8/30; C08L 63/10

U.S. Cl. 525—502 **18 Claims**

1. A dispersion which comprises an uncured vinylized epoxy resin prepared from an uncured epoxy resin as a continuous phase having dispersed therein (i) an insoluble polymer and (ii) a dispersion stabilizer which is the polymerizate of at least one vinyl monomer and a vinylized epoxy resin adduct derived from the reaction product of an unsaturated carboxylic acid and a polyepoxide, said insoluble polymer having been polymerized in situ in the uncured epoxy resin and in the presence of the dispersion stabilizer, and the uncured epoxy resin subsequently vinylized by reacting the uncured epoxy resin with an ethylenically unsaturated acid; the insoluble polymer dispersed phase further characterized in that it forms an insoluble polymer dispersion in the uncured epoxy and remains a stable dispersion in the vinylized epoxy resin at a temperature above 60° C.

4,690,989

METHOD FOR THE SINGLE-STEP PRODUCTION OF VINYL POLYMERS

Miloslav Kolínsky; Václava Jisová, and Josef Babka, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Czechoslovakia

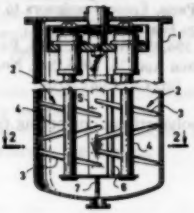
Filed Nov. 8, 1985, Ser. No. 796,558

Claims priority, application Czechoslovakia, Nov. 10, 1984, 8572-84

Int. Cl.[4] C08F 2/02, 14/06

U.S. Cl. 526—88 **3 Claims**

1. A method for the single-step production of vinyl polymers by a non-radical heterogeneous polymerization in bulk under the effect of organometallic catalysts, which comprises: adding a vinyl monomer to a vertical, cylindrical reactor which is provided with at least two planetary stirrers placed outside of the reactor axis each of said planetary stirrers having at least one planar centrally symmetrical two-blade paddle, and means for wiping the sidewalls of said reactor; subsequently introducing into said reactor a solution of an organometallic catalyst under intense stirring in sequential partial doses of size 10^{-5} to 10^{-3} mole to achieve a total catalyst amount of 5×10^{-4} to 5×10^{-2} mole of catalyst per mole of the monomer; allowing the monomer to undergo non-radical heterogeneous polymerization under the influence of the organometallic catalyst; intensely stirring the contents of the reactor; cutting and disintegrating any formed compact mass with the planetary stirrers



while concurrently wiping the sidewalls of the reactor with said wiping means until the polymer acquires a powdery form; and discharging the powdery product.

4,690,990

POLYMERIZATION PROCESS USING A CATALYST COMPRISING A PHOSPHATE AND WITH A BIS-(CYCLOPENTADIENYL)CHROMIUM(II) COMPOUND

Max P. McDaniel, and James N. Short, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 363,681, Mar. 30, 1982, Pat. No. 4,424,139. This application Sep. 24, 1982, Ser. No. 423,499

Int. Cl.[4] C08F 4/44, 4/02

U.S. Cl. 526—138 **24 Claims**

1. A polymerization process comprising:

contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule in a reaction zone under polymerization conditions with a catalyst system comprising:

(a) a catalyst comprising a bis-(cyclopentadienyl)chromium(II) compound and a phosphate-containing support;

(b) an organometal cocatalyst; and

recovering a polymer.

4,690,991

PROCEDURE FOR MAKING COPOLYMERS OF ETHYLENE AND LONG-CHAINED ALPHA OLEFINS

Jukka Seppälä , Helsinki, Finland, assignor to Neste Oy, Finland

PCT No. PCT/FI84/00045, § 371 Date Feb. 4, 1985, § 102(e) Date Feb. 4, 1985, PCT Pub. No. WO85/00172, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 21, 1984, Ser. No. 711,575

Claims priority, application Finland, Jun. 22, 1983, 83/2287

Int. Cl.[4] C08F 2/14, 210/6

U.S. Cl. 526—158 **12 Claims**

1. Method of forming a terpolymer having a density of at least about 0.900 kg/dm$_3$ of an at least 11 carbon atom olefin, ethylene and 1-butylene, which comprises

polymerizing ethylene with said long-chain α-olefin of at least 11 carbon atoms, by suspension polymerization in the presence of a catalyst composed of Al-activated titanium chloride and triethyl aluminum to form a terpolymer thereof,

said polymerization being effected at a temperature of up to 120° C. in a fluid in which the resulting terpolymer is insoluble, in the presence of about 0.01–2.0 mol/dm$_3$ of 1-butylene,

whereby the reactivity of the long-chain α-olefin is increased, and the quantity of long-chain α-olefin in the resulting terpolymer is regulated to between about 0.01 and 15% by weight.

4,690,992

POLYMERIZATION OF DIFUNCTIONAL RING COMPOUNDS

Robert H. Grubbs; Laura R. Gilliom, both of Pasadena, Calif., and Alain Siove, Paris, France, assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 594,355, Mar. 28, 1984, Pat. No. 4,607,112. This application Apr. 24, 1986, Ser. No. 855,370

Int. Cl.[4] C08F 4/64

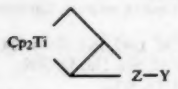
U.S. Cl. 526—160 12 Claims

1. A method of polymerizing comprising reacting a monomer of the formula:

where Z is a hydrocarbon or heterocarbon linkage containing 2 to 6 carbon atoms within a strained ring and Y contains a group polymerizable by a Lewis acid or by a transition metal catalyst but not polymerizable by the present catalyst, with a source of:

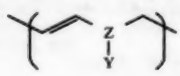
Cp_2TiCH_2

to form a titanacyclobutane complex catalyst of the formula:



adding an excess of said monomer to the complex; and

polymerizing the monomer by selectively and controllably opening the ring containing the strained olefin without polymerizing the other group to form a polymer having a repeating unit of the formula:



4,690,993

P-(2-HYDROXY HEXAFLUOROISOPROPYL) STYRENE [HFIS] MONOMER FOR OPHTHALMIC APPLICATIONS

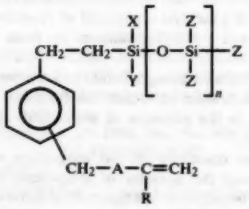
Joseph J. Falcetta, and Joonsup Park, both of Arlington, Tex., assignors to Alcon Laboratories, Inc., Forth Worth, Tex.

Continuation-in-part of Ser. No. 801,259, Nov. 25, 1985. This application Dec. 31, 1985, Ser. No. 815,439

Int. Cl.[4] C08F 212/20, 230/08

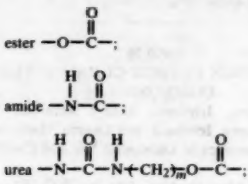
U.S. Cl. 526—242 7 Claims

1. A copolymer for preparation of optical lenses which comprises a siloxane main monomer polymerizable to make a colorless, eye-inert polymer, said siloxane monomer having the formula:



where

(1) "A" is selected from the group consisting of:

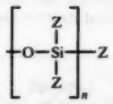


where m is a number and is from 2–4;

(2) R is hydrogen or methyl;

(3) X and Y are selected from the group consisting of C_1 to C_5 alkyl groups, phenyl groups and W groups;

(4) W is a group of the structure



(5) Z is selected from the group consisting of C_1 to C_5 alkyl groups and phenyl groups; and

(6) n is an integer from zero to five; and from about 10% by weight to about 60% by weight of a hydroxyperfluoroalkylstyrene of the formula:

wherein X and Y are selected from the group consisting of monovalent perfluoralkyl, hydroperfluoroalkyl, and chloroperfluoralkyl of up to 8 carbon atoms.

4,690,994

HIGH MOLECULAR WEIGHT FLUOROELASTOMER

Yoshinori Masuda, Nobeoka; Hiroshi Saito, Chiba, and Hiroshi Kobayashi, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 5, 1985, Ser. No. 804,772

Claims priority, application Japan, Dec. 26, 1984, 59-273338; May 14, 1985, 60-102239; Sep. 4, 1985, 60-195617; Sep. 9, 1985, 60-199015

Int. Cl.[4] C08F 14/22

U.S. Cl. 526—254 14 Claims

1. A fluoroelastomer containing 65 to 100 wt % of vinylidene fluoride units and hexafluoropropylene units and 35 to 0 wt % of tetrafluoroethylene units wherein the fluoroelastomer has the following characteristics:

(a) the weight ratio of vinylidene fluoride units to hexafluoropropylene units is in the range of 80:20 to 50:50;

(b) the intrinsic viscosity is in the range of 250 to 500 ml/g;

(c) the ratio ($\overline{M}w/\overline{M}n$) of weight-average molecular weight ($\overline{M}w$) to number-average molecular weight ($\overline{M}n$) is in the range of 2 to 12; and

(d) said fluoroelastomer has a bimodal molecular weight distribution, and the ratio (h_2/h_1) of the peak-height (h_2) of higher molecular weight to the peak-height (h_1) of

lower molecular weight shown by a chart of gel permeation chromatography is in the range of 0.8 to 4.0.

4,690,995

COPOLYMERS CONTAINING HIGH CONCENTRATIONS OF PHENOL ANTIOXIDANT UNITS

William H. Keskey, Midland, and Mark R. Johnson, Breckenridge, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 6, 1985, Ser. No. 741,997

Int. Cl.[4] C08F *220/40, 220/38, 220/36, 220/28, 220/58, 220/68, 220/70*

U.S. Cl. 526—286 **31 Claims**

1. The process of producing an oxidation resistant composition of matter comprising a polymer derived from emulsion polymerizing at a pH lower than about 5.0 a monomer system comprising (a) 20 to 50 parts by weight per hundred parts by weight of total monomer of at least one hindered phenol antioxidant monomer having an addition polymerizable double bond of the formula:

Ph-A1-D

wherein Ph is a hindered phenol group having at least one branched or cyclic lower alkyl substituent of at least 3 carbon atoms ortho to the hydroxyl group; A1 is $-(CH_2)_k-$, —S—, —O—, $-CH_2O-$, $-CH_2S-$, where k is 1 or 2; and D is an acyclic substituent of the formula:

$$-(CR'_2)_m-A2-(CR'_2)_n-A3-(CR'_2)_p-A4-(CR'_2)_q-A5-E$$

wherein each A2, A3, A4 and A5 is independently selected from the group consisting of a thioether, ether, carboxylic acid ester, thioester, carboxylic acid amide, urethane-type linkage and nothing; m, n, p, and q are independently integers of zero to 4, but where A1 is —O— or —S—, m is not zero; each R' is independently H or a (substituted) alkyl group; and E is a group having addition polymerizable unsaturation, and (b) at least 15 to 60 parts by weight of at least one 3 to 8 carbon α,β-ethylenically unsaturated carboxylic acid monomer.

4,690,996

INVERSE EMULSIONS

Yen-Jer Shih, Somerset; John (Ji-Hsiung) Tsai, Belle Meade; Wen B. Chiao, and Dilip K. Ray-Chaudhuri, both of Bridgewater, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 28, 1985, Ser. No. 770,332

Int. Cl.[4] C08L *51/02*

U.S. Cl. 527—312 **20 Claims**

1. A water soluble or water swellable graft copolymer dispersed in an inverse water-in-oil emulsion comprising:

(a) 20–80% by weight of the emulsion of an aqueous discontinuous phase comprising 30–70% by weight water and 70–30% by weight of a polysaccharide copolymer having a polysaccharide content of 5 to 50%; and

(b) 80 to 20% by weight of a continuous phase comprising 70 to 99% inert hydrophobic liquid; and 1 to 30% by weight of an oil soluble surfactant.

4,690,997

FLAME RETARDANT WIRE COATING COMPOSITIONS

James A. Cella, Clifton Park; Marsha M. Grade, and Thomas L. Evans, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

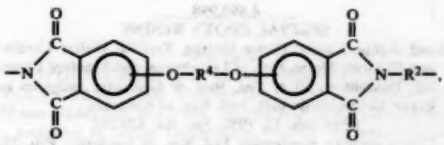
Continuation-in-part of Ser. No. 574,118, Jan. 26, 1984, abandoned. This application Jul. 31, 1985, Ser. No. 760,792

Int. Cl.[4] C08G *77/04*

U.S. Cl. 528—26 **10 Claims**

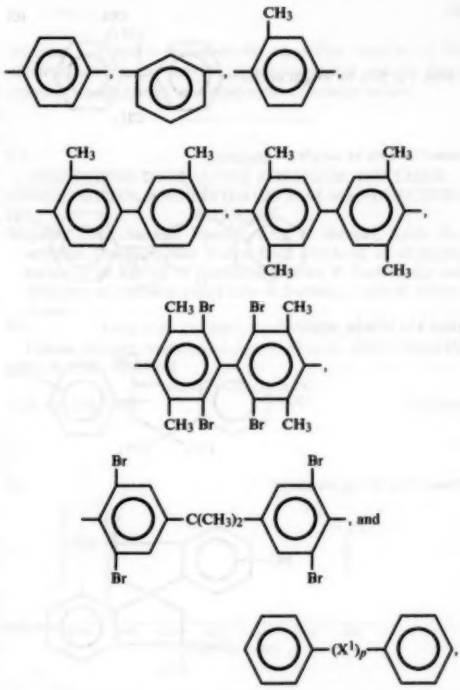
1. Extrudable, flame retardant, polydiorganosiloxane polyimide comprising by weight,

(A) from about 40 to 90% of chemically combined aryletherimide units having the formula,

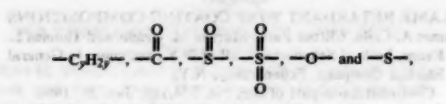


and

(B) from about 10 to 60% of chemically combined polydiorganosiloxane consisting essentially of from about 11 to about 20 diorganosiloxy units, where the organo radicals attached to silicon are selected from monovalent $C_{(1-14)}$ hydrocarbon radicals and substituted monovalent $C_{(1-14)}$ hydrocarbon radicals, R^2 is selected from the class consisting of the same or different $C_{(1-14)}$ divalent hydrocarbon radicals, or substituted $C_{(1-14)}$ divalent hydrocarbon radicals, and R^4 is a divalent aryl radical selected from the class consisting of



X^1 is a member selected from the class consisting of



and p is 0 or 1, and y is an integer equal to 1 to 5 inclusive.

4,690,998

SPECIAL EPOXY RESINS

Bernd Wahle, Kaarst; Dieter Freitag, Krefeld; Walter Uerdingen; Heinrich Heine, both of Leverkusen, and Manfred Blazejak, Dusseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

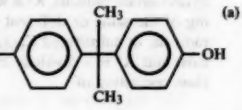
Filed Feb. 14, 1986, Ser. No. 829,205

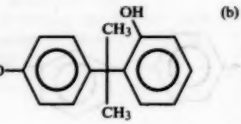
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1985, 3506519

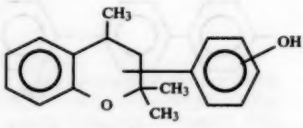
Int. Cl.[4] C08G *59/00, 65/08, 65/14*

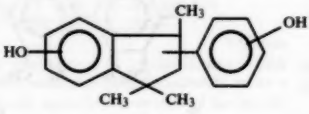
U.S. Cl. 528—96 **1 Claim**

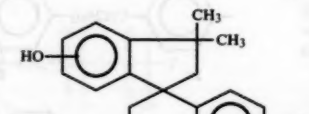
1. An epoxy resin which is the reaction product of epichlorohydrin and a phenolic mixture wherein the phenolic mixture is:

from 5 to 95% by weight of  (a)

from 1 to 20% by weight of  (b)

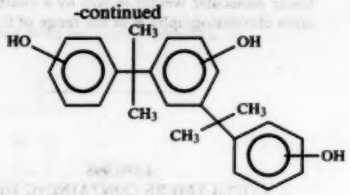
from 5 to 30% by weight of  (c)

from 5 to 25% by weight of  (d)

from 0.5 to 5% by weight of  (e)

from 0.5 to 10% by weight of (f)

-continued



and

from 0 to 10% by weight of phenol. (g)

4,690,999

LOW THERMAL EXPANSION RESIN MATERIAL AND COMPOSITE SHAPED ARTICLE

Shun-ichi Numata; Koji Fujisaki; Noriyuki Kinjo; Junichi Imaizumi, all of Hitachi, and Yoshikatsu Mikami, Shimodate, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,736

Claims priority, application Japan, Aug. 1, 1983, 58-139438; Aug. 19, 1983, 58-152351

Int. Cl.[4] G08G *18/06;* **C08G** *73/10*

U.S. Cl. 528—188 **12 Claims**

1. A low thermal expansion resin material comprising a polyimide having as a chemical structural unit at least one aromatic ring which can rotate around its molecular axis but which has no flexibility in another direction and which is bonded at para positions, said polyimide having a molecular chain oriented so as to have a substantially linear structure on a plane by stretching a film of the polyimide or a precursor thereof uniaxially or biaxially with stretcher and exhibiting a linear thermal expansion coefficient of $3\times[10^5]10^{-5}$ to $4\times10^{-7}\,k^{-1}$.

4,691,000

OXYMETHYLENE COPOLYMERS AND PROCESS FOR THEIR PREPARATION

André Collart, Rixensart, and Fredy Declerck, Grimbergen, both of Belgium, assignors to Solvay & Cie. (Société Anonyme), Brussels, Belgium

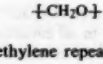
Filed Apr. 11, 1986, Ser. No. 850,550

Claims priority, application France, Apr. 15, 1985, 85 05756

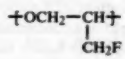
Int. Cl.[4] C08G *10/02, 79/02*

U.S. Cl. 528—244 **20 Claims**

1. Copolymers containing oxymethylene repeating units having the formula



and 2-fluoromethoxyethylene repeating units having the formula



4,691,001

PROCESS FOR MAKING SOLID UREA-FORMALDEHYDE RESINS

David Taylor, Halesowen, England, assignor to BIP Chemicals, Ltd., Manchester, England

Continuation-in-part of Ser. No. 704,405, Feb. 22, 1985, Pat. No. 4,564,667. This application Oct. 31, 1985, Ser. No. 793,318

Claims priority, application United Kingdom, Feb. 23, 1984, 8404758; Aug. 1, 1985, 8519392

The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.

Int. Cl.[4] C08G *12/34*

U.S. Cl. 528—256 17 Claims

1. A process for the manufacture of a solid urea-formaldehyde resin which comprises the steps of

(a) reacting a solution of formaldehyde in water with urea under acid conditions at a molar ratio of formaldehyde to urea which is greater than 2.5 to 1 the reaction conditions being 15 to 100 minutes at 100° C. at pH6 or their equivalent, and adjusting the pH to be neutral to mildly alkaline;

(b) concentrating the solution so made its water content to less that 50 percent by weight

(c) adding further urea to adjust the molar ratio of formaldehyde to urea to between 2.0 to 1 and 1.1 to 1, and

(d) evaporating water from the solution under conditions whereby rapid evaporation of water takes place without substantial increase in the degree of condensation of the resin and without substantial precipitation of the solid resin to reduce the water content to such a level that on cooling the liquid resin product a friable solid is obtained.

4,691,002

UNSATURATED HOMO- AND/OR COPOLYMERIZABLE POLYESTERS

Günther Hegemann, and Karin Miedeck, both of Hamburg, Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Münster-Hiltrup, Fed. Rep. of Germany

Continuation of Ser. No. 519,489, Aug. 1, 1983, abandoned. This application Jan. 30, 1986, Ser. No. 823,980

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1983, 3229639

Int. Cl.[4] C08G *63/52, 63/54, 63/68, 63/76*

U.S. Cl. 528—289 10 Claims

1. An unsaturated homo- and/or copolymerizable polyester prepared by the simultaneous reaction of:

(a) a diol selected from the group consisting of glycol, propane diol, butane diol, hexane diol, neopentyl glycol, trimethyl hexane diol, cyclohexane dimethanol, tricyclodecane diol, 1,1-bishydroxymethylcyclohexene-3, and tricyclodecane monoglycerin ether;

(b) a dicarboxylic acid selected from the group consisting of maleic acid, fumaric acid, itaconic acid, mesaconic acid, aconitic acid, esters thereof, anhydrides thereof and acid chlorides thereof;

(c) an end-position hydroxylated polybutadiene having an average molecular weight of about 2400 to 3000, an average hydroxy functionality of about 2.2 to 2.4, and a microstructure of about 60 percent 1,4-trans, about 20 percent 1,4-cis and about 20 percent vinyl, the amount of said hydroxylated polybutadiene being from 1 to 10 mol percent relative to the total amount of diol and hydroxylated polybutadiene present in the polyester.

5. An unsaturated homo- and/or copolymerizable polyester according to claim 1, wherein the components are further defined as:

(a) trimellitic acid anhydride;

(b) neopentyl glycol;

(c) said end-position hydroxylated polybutadiene having an average molecular weight of about 2800 and a hydroxyfunctionality of about 2.2 to 2.4;

(d) maleic acid anhydride; and

(e) the reaction product of tetrahydrophthalic acid anhydride and monoethanolamine.

4,691,003

UNIFORM POLYMERIC FILAMENTS

Benjamin C. Sze, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 30, 1986, Ser. No. 857,278

Int. Cl.[4] C08G *63/02*

U.S. Cl. 528—308.1 1 Claim

1. A continuous filament polyester yarn spun at a spinning speed of at least 8 Km/min having a DSC endotherm temperature in the range of from about 264 to about 273 degrees centigrade and having a tenacity at break greater than that expressed by the relationship $t=79.89-0.278T$ wherein T is the DSC endotherm temperature in degrees centigrade and t is the tenacity at break in grams per denier.

4,691,004

COPOLYMERIZATION OF LACTAM WITH DIENE POLYMER HAVING AMINO OR IMINO END GROUPS

Masao Nishiyama, and Yasuo Hirano, both of Hirakata, Japan, assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 22, 1985, Ser. No. 789,991

Claims priority, application Japan, Oct. 30, 1984, 59-226941

Int. Cl.[4] C08G *69/14, 69/18*

U.S. Cl. 528—323 9 Claims

1. A process for producing a lactam copolymer, which comprises copolymerizing an omega-lactam and a diene polymer having an amino or imino group at molecular ends by the action of an alkaline catalyst and a polyfunctional co-catalyst, the proportions of the components satisfying the following equations (I) and (II)

$$a/c>1 \quad \text{(I)}$$

$$b/c>1 \quad \text{(II)}$$

wherein a, b and c represent the equivalent weights of the alkaline catalyst, the polyfunctional co-catalyst and the diene polymer, respectively, per equivalent of omega-lactam.

4,691,005

THIOPHENE DERIVATIVE POLYMER, POLYMER COMPOSITION, AND METHODS FOR MANUFACTURE THEREOF

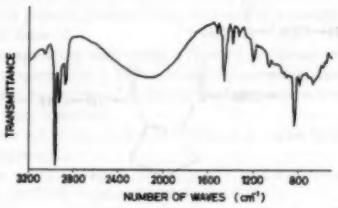
Masaaki Sato; Susumu Tanaka, both of Ibaraki; Kyoji Kariyama, Tsuchiura, and Yoshio Suda, Hachioji, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Feb. 21, 1986, Ser. No. 831,494

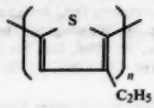
Claims priority, application Japan, Mar. 9, 1985, 60-46816; Mar. 9, 1985, 60-46818

Int. Cl.[4] C08G *75/00*

U.S. Cl. 528—380 1 Claim



1. A poly-[2,5-(ethylthienylene)] having a trtansmitting light of orange color represented by the formula:



wherein n denotes a number of at least 110 and not more than 250.

4,691,006

ANTIGENIC MODIFICATION OF POLYPEPTIDES

Vernon C. Stevens, Dublin, Ohio, assignor to Ohio State University, Columbus, Ohio

Continuation-in-part of Ser. No. 472,190, Mar. 4, 1983, Pat. No. 4,526,716, and a continuation-in-part of Ser. No. 00,777, May 18, 1983, said Ser. No. , is a continuation-in-part of Ser. No. 323,690, Nov. 20, 1981, Pat. No. 4,384,995, which is a continuation-in-part of Ser. No. 112,628, Jan. 16, 1981, Pat. No. 4,302,386, which is a division of Ser. No. 936,876, Aug. 25, 1978, Pat. No. 4,201,770, which is a continuation-in-part of Ser. No. 622,031, Oct. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 462,955, Apr. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 406,821, Oct. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 357,892, May 7, 1973, abandoned. This application Nov. 2, 1984, Ser. No. 667,863

Int. Cl.⁴ C07K *7/10*

U.S. Cl. 530—324 **7 Claims**

1. A peptide having an amino acid sequence corresponding to the C-terminal sequence of the beta subunit of human chorionic gonadotropin, said peptide comprising from 20 to 45 amino acid residues.

4,691,007

PROLINE DERIVATIVES

Anand S. Dutta, Stockport, England; Ross L. Stein, Wilmington, Del.; Diane A. Trainor, Glen Mills, Pa., and Richard A. Wildonger, Newark, Del., assignors to ICI Americas Inc., Wilmington, Del. and Imperial Chemical Industries PLC, United Kingdom

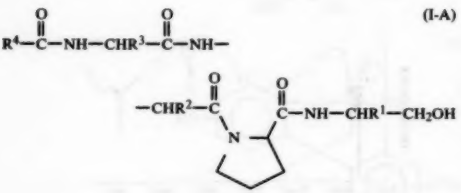
Division of Ser. No. 603,408, Apr. 24, 1984, Pat. No. 4,596,789. This application Dec. 6, 1985, Ser. No. 806,265

Claims priority, application United Kingdom, Apr. 27, 1983, 8311423; May 27, 1983, 8314708

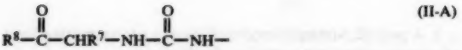
Int. Cl.⁴ C07C *103/52*; A61K *37/02*; C07D *207/00*

U.S. Cl. 530—331 **3 Claims**

1. A compound of the following formula (I-A), (II-A) or (III-A):

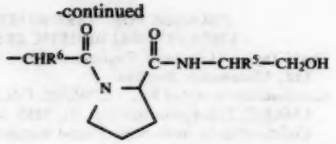


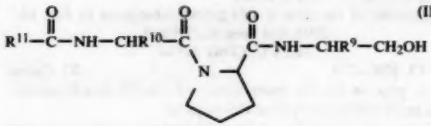
(I-A)



(II-A)

-continued





(III-A)

wherein

R^1, R^5 and R^9 are lower alkyl groups containing from 3 to about 6 carbon atoms;

R^2, R^3, R^6, R^7 and R^{10} are alkyl groups of about 1 to 10 carbon atoms which may optionally be substituted by a monocyclic aryl group or by an amide, urea or carbamate group via the nitrogen thereof; and

R^4 and R^{11} are lower alkyl, substituted lower alkyl, lower alkoxy or substituted lower alkoxy groups wherein the alkyl or alkoxy contains about 1 to 6 carbon atoms, or monocyclic or bicyclic aryl groups; and

R^8 is hydroxy, a lower alkoxy group containing about 1 to 6 carbon atoms, or an aralkoxy group containing about 7 to 12 carbon atoms;

and wherein —CHR^2—, —CHR^3—, —CHR^6—, —CHR^7—, —CHR^{10}— and the proline group are of the L-configuration.

4,691,008

PROCESS FOR THE LOW-RACEMIZATION PREPARATION OF PEPTIDE INTERMEDIATES OF THE SYNTHESIS OF GONADORELIN AND GONADORELIN ANALOGS, AND NEW INTERMEDIATES FOR THIS PROCESS

Rainer Uhmann, Kriftel, and Kurt Radscheit, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

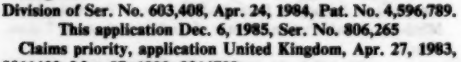
Filed Mar. 25, 1985, Ser. No. 715,418

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1984, 341124

Int. Cl.⁴ C07K *1/02, 5/08, 7/06*

U.S. Cl. 530—339 **10 Claims**

1. A process for the preparation of peptides of the Formula I



(I)

wherein

U denotes a urethane protective group,

A^1 denotes Trp or D-Trp,

A^2 denotes Ser, Ala or Thr,

A^3 denotes Tyr or Phe,

A^4 denotes Gly, the residue of a D-amino acid or the residue of a D-amino acid derivative,

A^5 denotes Leu, N-methyl-Leu, N-ethyl-Leu, Ser(Bu^t), Cys(Bu^t), Asp(OBu^t), Glu(OBu^t), Orn(Boc) or Lys(Boc) and

X denotes OBu^t or A^6—Pro—Y,

where

A^6 represents Arg, Orn, Lys or homoarginine, and

Y represents Gly—NH_2, NH—NH—CO—NH_2, (C_1–C_3)-alkylamino, cyclopropylamino, (C_1–C_3)-alkylamino which is substituted with hydroxyl or fluorine, or cycloalkylamino which is substituted with hydroxyl or fluorine, which process comprises reacting a tripeptide of the formula II

(II)

having a free carboxyl group, in which U, A^1, A^2 and A^3 have the above-mentioned meaning, with a peptide of the formula III

$$H—A^4—A^5—X \quad (III)$$

having a free amino group and a protected carboxyl group, in which A^4, A^5 and X have the above-mentioned meaning, or its derivative having a free amino group and a protected carboxyl group in the presence of a condensing agent.

4,691,009

HYBRID PROTEINS PRODUCED BY AN ULTRAHIGH PROKARYOTIC EXPRESSION SYSTEM

John L. Palmer, and Algis Anilionis, both of Arlington, Mass., assignors to Repligen Corporation, Cambridge, Mass.

Filed Dec. 26, 1984, Ser. No. 686,342
Int. Cl.[4] C07K *15/00*
U.S. Cl. 530—350 **3 Claims**

1. A hybrid protein having the following amino acid sequence:

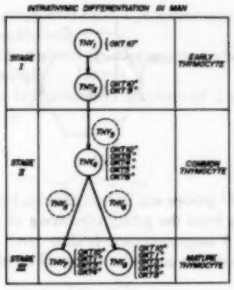
Met Leu Arg Pro Val Glu Thr Pro Thr Arg Glu Ile Lys Lys Leu Asp Gly Leu Trp Ala Phe Ser Leu Asp Arg Glu Asn Cys Gly Ile Asp Gln Arg Trp Trp Glu Ser Ala Leu Gln Glu Ser Arg Ala Ile Ala Val Pro Gly Ser Phe Asn Asp Gln Phe Ala Asp Ala Asp Ile Arg Asn Tyr Als Gly Asn Val Trp Tyr Gln Arg Glu Val Phe Ile Pro Lys Gly Trp Ala Gly Gln Arg Ile Val Leu Arg Phe Asp Ala Val Thr His Tyr Gly Lys Val Trp Val Asn Asn Gln Glu Val Met Glu His Gln Gly Gly Tyr Thr Pro Phe Glu Ala Asp Val Thr Pro Tyr Val Ile Ala Gly Lys Ser Val Arg Ile Thr Val Cys Val Asn Asn Glu Leu Asn Trp Gln Thr Ile Pro Pro Gly Met Val Ile Thr Asp Glu Asn Gly Lys Lys Lys Gln Ser Tyr Phe His Asp Phe Phe Asn Ser Met Thr Leu Leu Ile Ser Gly Gly Val Thr Pro Ala Ala Asn Ala Ala-Gln His Asp Glu Ala Gln Gln Asn Ala Phe Tyr Gln Val Leu Asn Met Pro Asn Leu Asn Ala Asp Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Val Leu Gly Glu Ala Gln Lys Leu Asn Asp Ser Gln Ala Pro Lys Ala Asp Ala Gln Gln Asn Lys Phe Asn Lys Asp Gln Gln Ser Ala Phe Tyr Glu Ile Leu Asn Met Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Thr Asn Val Leu Gly Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala Asp Asn Asn Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu ILe Leu Asn Met Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys Lys Leu Asn Glu Ser Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Gln Ser Ala Asn Leu Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys Ala Asp Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu Pro Asn Leu Thr Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys Asp Asp Pro Ser Val Ser Lys Glu Ile Leu Ala Glu Ala Lys Lys Leu Asn Asp Ala Gln Ala Pro Lys Glu Glu Asp Asn Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Asn Lys Asn Leu Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Asn Lys Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Lys Pro Gly Lys Glu Asp Gly Asn Gly Val Ile Asp Asp Lys Leu Ser Asn Met Arg Ile Leu Glu Asp Glu Arg Ala Ser.

4,691,010

HYBRID CELL LINE FOR PRODUCING MONOCLONAL ANTIBODY TO A HUMAN EARLY THYMOCYTE ANTIGEN, ANTIBODY, AND METHODS

Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 432,458, Oct. 4, 1982, Pat. No. 4,624,925, which is a division of Ser. No. 100,071, Dec. 4, 1979, Pat. No. 4,364,934. This application Aug. 9, 1984, Ser. No. 639,162
The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.
Int. Cl.[4] A61K *39/395, 35/16;* C12N *5/00;* C12P *21/00*
U.S. Cl. 530—387 **1 Claim**



1. A monoclonal antibody having the identifying characteristics of the product of hybridoma ATCC 8021.

4,691,011

WATER-DISPERSIBLE HYDROPHILIC MILK PROTEIN PRODUCT

Kaoru Inagami, Tokyo, and Noboru Kikuchi, Kawasaki, both of Japan, assignors to The Calpis Food Industry Co., Ltd., Japan

Filed Dec. 16, 1985, Ser. No. 809,569
Claims priority, application Japan, Dec. 24, 1984, 59-270709
Int. Cl.[4] A23C *9/12*
U.S. Cl. 530—832 **17 Claims**

1. A milk protein product having water-dispersible and hydrophilic properties and containing substantially no serum, said milk protein product being obtained by a process comprising the steps of:

(a) coagulating milk under a flowing condition and at a pH ranging from 5.10 to 6.10 and temperatures ranging from 38 to 86 degrees C., wherein the temperature y and the pH x vary together,

from $x=5.10$ to $x=(y+247)/52.3$ as y varies from 38 to 62 degrees C.,

from $x=(y+244)/60$ to $x=(y+247)/52.3$ as y varies from 62 to 72.03 degrees C., and

from $x=(y+244)/60$ to $x=6.10$ as y varies from 72.03 to 86 degrees C.,

to thus obtain a coagulum; and

(b) separating said coagulum.

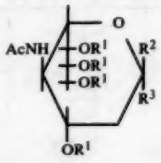
4,691,012

SIALIC ACID DERIVATIVE AND PROCESS FOR PREPARING THE SAME

Haruo Ogura, Matsudo; Kimio Furuhata, Tokyo; Toshiaki Osawa, Tokyo; Satoshi Toyoshima, Tokyo; Yoshiyasu Shitori, Musashino; Masayoshi Ito, Kunitachi, and Shoji Yoshimura, Iruma, all of Japan, assignors to MECT Corporation, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,638
Claims priority, application Japan, Mar. 9, 1984, 59-44906
Int. Cl.[4] C07H *17/00*
U.S. Cl. 536—23 16 Claims

1. An N-acetylneuraminic acid represented by the general formula:



wherein the R^1 groups are, independently, hydrogen or acetyl; R^2 is selected from the group consisting of uridine, 5-fluoro-uridine, 2', 3'-isopropylidene-uridine and 5-fluoro-2',3-isopropylidene-uridine; and R^3 is carboxyl or methoxycarbonyl.

4,691,013

PROCESS FOR PRODUCTION OF MODIFIED HYDROXYETHYL CELLULOSE

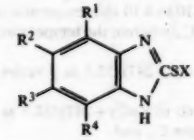
Yukihiko Sekimoto, Chiba; Makoto Yanagita, Tokyo, and Shoichi Kanda, Yokosuka, all of Japan, assignors to Lion Corporation and Nitto Chemical Industry Co., Ltd, both of Tokyo, Japan

Filed Aug. 27, 1986, Ser. No. 900,954
Claims priority, application Japan, Sep. 3, 1985, 60-193141
Int. Cl.[4] C08B *11/20*
U.S. Cl. 536—96 6 Claims

1. A process for producing a modified hydroxyethyl cellulose comprising the steps of:

allowing hydroxyethyl cellulose to be swollen in a solvent; and

mixing the hydroxyethyl cellulose swollen in the solvent with a 2-mercapto benzimidazole compound having the formula (I):



(I)

wherein R^1, R^2, R^3, and R^4 independently represent hydrogen, methyl, or ethyl, and X is hydrogen, an alkali metal, an alkaline earth metal, or ammonium.

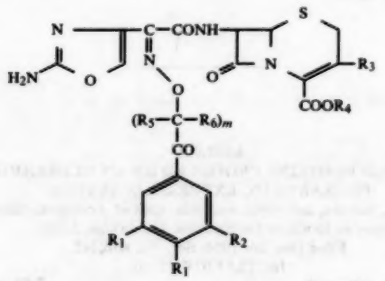
4,691,014

CEPHALOSPORIN COMPOUNDS

Takanobu Naito, Funabashi; Masaaki Yokoyama, Tokyo; Kazuya Sasaki, Higashikurume; Makoto Yamamoto, Tokyo, and Kouji Amemiya, Kodaira, all of Japan, assignors to Kaken Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1985, Ser. No. 782,567
Claims priority, application Japan, Oct. 19, 1984, 59-218660
Int. Cl.[4] C07D *501/22*; A61K *31/545*
U.S. Cl. 540—227 10 Claims

1. A cephalosporin compound having the formula:



(I)

wherein R_1 is a hydroxy group, a lower alkanoyloxy group or a lower alkoxycarbonyl group, R_2 is a hydrogen atom, a hydroxy group, a lower alkanoyloxy group or a lower alkoxycarbonyloxy group, R_3 is a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkenyl group, a lower alkoxy group, or $—CH_2R_7$ wherein R_7 is a hydrogen atom, an azido group, a lower alkanoyloxy group, a carbamoyloxy group, a pyridinium group, a 4-sulfoethyl pyridinium group, or a thiazolylthio, thiadiazolylthio, triazolylthio, oxazolylthio, tetrazolylthio, pyridinylthio, pyrimidinylthio or triazinylthio group which is unsubstituted or substituted by a lower alkyl, carboxyalkyl or dimethylaminoethyl group, R_4 is a hydrogen atom or a carboxy-protecting group, each of R_5 and R_6 is a hydrogen atom or a lower alkyl group, or R_5 and R_6 form a cycloalkylidene group together with the carbon atom to which they are attached, and m is 0 or 1, or a pharmaceutically acceptable salt thereof.

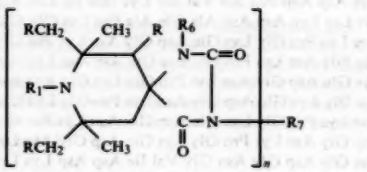
4,691,015

HYDROXYLAMINES DERIVED FROM HINDERED AMINES

Rudolf A. Behrens, New Fairfield, Conn., and Raymond Seltzer, New City, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 633,549, Jul. 23, 1984, Pat. No. 4,590,231, which is a continuation-in-part of Ser. No. 540,732, Oct. 11, 1983, abandoned. This application Mar. 21, 1985, Ser. No. 714,651
Int. Cl.[4] C07D *413/04, 401/14, 401/02, 295/00, 211/94*
U.S. Cl. 544—198 9 Claims

1. A compound of formula D, G, I-K or M



(D)

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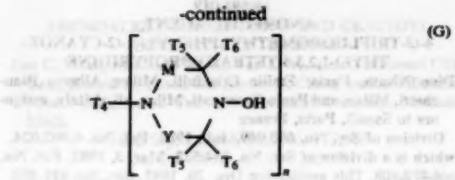
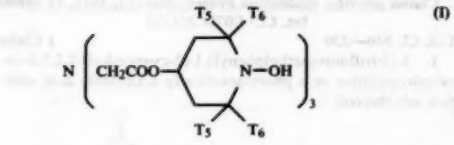
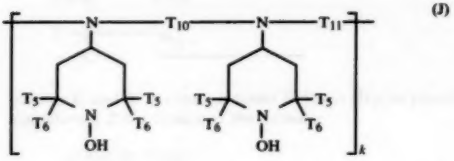


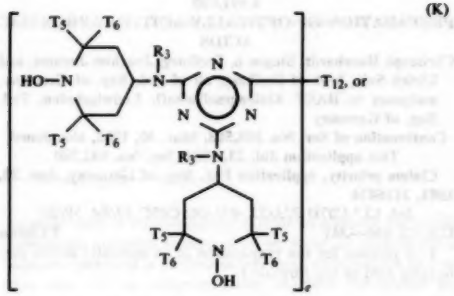
(G)



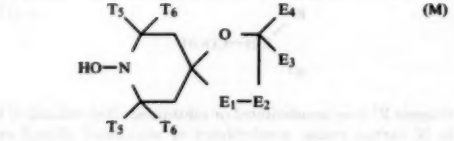
(I)



(J)



(K)



(M)

wherein

R is hydrogen or methyl

n is 1 or 2,

R_1 is hydroxyl,

R_6 is hydrogen, C_1–C_{12} alkyl, allyl, benzyl, glycidyl or C_2–C_6 alkoxyalkyl;

when n is 1

R_7 is hydrogen, C_1–C_{12} alkyl, C_3–C_5 alkenyl, C_7–C_9 aralkyl, C_5–C_7 cycloalkyl, C_2–C_4 hydroxyalkyl, C_2–C_6 alkoxyalkyl, C_8–C_{10} aryl, glycidyl, a group of the formula $-(CH_2)_m-COO-Q$ or of the formula $-(CH_2)_m-O-CO-Q$ wherein m is 1 or 2, and Q is C_1–C_4 alkyl or phenyl; or when n is 2,

R_7 is C_2–C_{12} alkylene, C_6–C_{12} arylene, a group $-CH_2CH(OH)-CH_2-O-X-O-CH_2-CH(OH)-CH_2-$ wherein X is C_2–C_{10} alkylene, C_6–C_{15} arylene or C_6–C_{12} cycloalkylene, or a group $-CH_2CH(OZ^1)CH_2-(OCH_2CH_2)_2-$ wherein Z^1 is hydrogen, C_1–C_{18} alkyl, allyl, benzyl, C_2–C_{12} alkanoyl or benzoyl;

when n is 1,

T_4 is hydrogen, C_1–C_{18} alkyl, C_5–C_7 cycloalkyl, C_2–C_8 alkenyl unsubstituted or substituted by a cyano, carbonyl or carbamide group, or it is glycidyl, a group of the formula $-CH_2CH(OH)-Z$ or of the formula $-CONH-Z$ and Z is hydrogen, methyl or phenyl; or

when n is 2,

T_4 is C_2–C_{12} alkylene, C_6–C_{12} arylene, xylylene, a $-CH_2CH(OH)-CH_2$ group, or a group $-CH_2-CH(OH)-CH_2-O-X-O-CH_2-CH(OH)-CH_2-$ wherein X is C_2–C_{10} alkylene, C_6–C_{15} arylene or C_6–C_{12} cycloalkylene; or, provided that R_3 is not alkanoyl, alkenoyl or benzoyl, R_4 can also be divalent acyl radical of an aliphatic. cycloaliphatic or aromatic dicarboxylic acid or dicarbamic acid, or can be the group —CO—; or R_3 and R_4 together when p is 1 can be the cyclic acyl radical of an aliphatic or aromatic 1,2- or 1,3-dicarboxylic acid;

T_5 is methyl,

T_6 is methyl or ethyl, or T_5 and T_6 together are tetramethylene or pentamethylene;

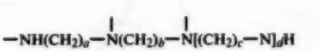
M and Y are independently methylene or carbonyl, but are not both carbonyl;

T_{10} and T_{11} are independently alkylene of 2 to 12 carbon atoms, or T_{11} is

T_8 and T_9 are independently hydrogen, alkyl of 1 to 18 carbon atoms, or T_8 and T_9 together are alkylene of 4 to 6 carbon atoms, or 3-oxapentamethylene,

k is 2 to 100,

T_{12} is



where a, b and c are independently 2 or 3, and d is 0 or 1; and e is 3 or 4;

E_1 and E_2, being different, each are oxo or imino,

E_3 is hydrogen, alkyl of 1 to 30 carbon atoms, phenyl, naphthyl, said phenyl or said naphthyl substituted by chloride or by alkyl of 1 to 4 carbon atoms, or phenylalkyl of 7 to 12 carbon atoms, or said phenylalkyl substituted by alkyl of 1 to 4 carbon atoms, and

E_4 is hydrogen, alkyl of 1 to 30 carbon atoms, phenyl, naphthyl or phenylalkyl of 7 to 12 carbon atoms, or

E_3 and E_4 together are polymethylene of 4 to 17 carbon atoms, or said polymethylene substituted by up to four alkyl groups of 1 to 4 carbon atoms.

4,691,016

INTERMEDIATES FOR THE PREPARATION OF 8,9-DIHALOBENZO[IJ]QUINOLIZINE CARBOXYLIC ACIDS

Richard M. Stern, Cottage Grove, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 671,606, Nov. 15, 1985, Pat. No. 4,556,713, which is a division of Ser. No. 318,927, Nov. 6, 1981, Pat. No. 4,524,148. This application Aug. 22, 1985, Ser. No. 768,127

Int. Cl.[4] **C07D** *471/04*

U.S. Cl. 546—95 **1 Claim**

1. The compound 8-amino-6,7-dihydro-9-fluoro-5-methyl-1-oxo-1H,5H-benzo[ij]quinolizine-2-carboxylic acid.

4,691,017
2-HYDROXY-AND 2-HALO-ETHYLTHIOPYRIDINE INTERMEDIATES FOR PREPARING ANTIULCER COMPOUNDS

Elemer Ezer; Kalman Harsanyi; Hajnalka Vikar née Pethó ; Judit Matuz; Laszló Szporny; Eszter Cholnoky; Osaba Kuthi; Ferenc Trischler; Bela Hegedus; Márta Kapolnás née Pap, and Anna Kállay née Sohonyai, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

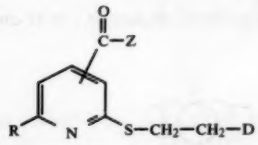
Continuation-in-part of Ser. No. 783,842, Oct. 3, 1985, Pat. No. 4,624,959, and Ser. No. 783,875, Oct. 3, 1985. This application Sep. 26, 1986, Ser. No. 912,999

Claims priority, application Hungary, Oct. 5, 1984, 3777/84; Oct. 5, 1984, 3775/84

Int. Cl.[4] C07D *213/70*

U.S. Cl. 546—298 **4 Claims**

1. A compound of the Formula (I)



(I)

wherein

R is hydrogen or C_1 to C_4 alkyl;

Z is phenyl optionally substituted by one or more halogen atoms and/or alkyl groups having 1 to 4 carbon atoms; and

D is hydroxy, mesyloxy, p-tosyloxy, or halogen; or a pharmaceutically acceptable acid addition salt thereof.

4,691,018
PYRIDINE DERIVATIVES AND THEIR USE AS ANTI-ALLERGIC AGENTS

Takashi Mori; Nobuhiro Ohi; Yoshiyuki Ohsugi, and Yasuhiro Yamashita, all of Tokyo, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

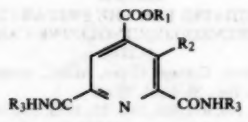
Filed May 6, 1986, Ser. No. 860,211

Claims priority, application Japan, May 23, 1985, 60-110642

Int. Cl.[4] C07D *213/60*

U.S. Cl. 546—309 **6 Claims**

1. A compound of the formula



wherein R_1 is a hydrogen atom or a lower alkyl group which may be substituted with hydroxy, lower alkoxy or di-lower alkylamino; R_2 is a hydrogen atom, an amino group or a lower alkylamino group; and R_3 is a lower alkyl group, and a non-toxic salt thereof.

4,691,019
ANORECTIC AGENT; 4-(3-TRIFLUOROMETHYLPHENYL)-1-(2-CYANOETHYL)-1,2,3,6-TETRAHYDROPYRIDINE

Dino Nisato, Pavia; Emilio Crisafulli, Milan; Alberto Bianchetti, Milan, and Paolo Carminati, Milan, all of Italy, assignors to Sanofi, Paris, France

Division of Ser. No. 630,969, Jul., 1984, Pat. No. 4,602,024, which is a division of Ser. No. 354,522, Mar. 3, 1982, Pat. No. 4,472,408. This application Dec. 20, 1985, Ser. No. 811,490

Claims priority, application France, Mar. 11, 1981, 81 04890

Int. Cl.[4] C07D *211/68*

U.S. Cl. 546—330 **1 Claim**

1. 4-(3-trifluoromethylphenyl)-1-(2-cyanoethyl)-1,2,3,6-tetrahydropyridine or a pharmaceutically acceptable acid addition salt thereof.

4,691,020
PREPARATION OF OPTICALLY ACTIVE CARBOXYLIC ACIDS

Christoph Ruechardt, Stegen b. Freiburg; Joachim Jaehme, and Ulrich Salz, both of Freiburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

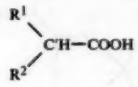
Continuation of Ser. No. 363,503, Mar. 30, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 632,700

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1981, 3116474

Int. Cl.[4] C07D *213/55, 401/06*; C07C *59/84, 59/86*

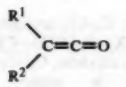
U.S. Cl. 546—341 **3 Claims**

1. A process for the preparation of an optically active carboxylic acid of the formula I



I

wherein R^1 is an unsubstituted or substituted alkyl radicals of 1 to 20 carbon atoms, unsubstituted or substituted alkenyl or alkynyl radicals having 2–20 carbon atoms, an unsubstituted or substituted cycloalkyl or cycloalkenyl radicals having 5 or 6 ring members, an unsubstituted or substituted benzyl, phenyl, naphthyl or pyridyl radical wherein substituted represents a member selected from the group consisting of C_1–C_{10}-alkyl, C_2–C_{10}-alkenyl, halogen, formyl, C_1–C_4-alkoxy, C_1–C_4-Carbalkoxy, C_1–C_4-acyl, C_1–C_4-acyloxy or amino which is linked to the asymmetric C′ atom via a carbon atom and R^2 is one of the radicals R^1 (but not the same radical) or halogen which is bonded to the asymmetric C′ atom via an oxygen atom, which process comprises reacting a ketene II



II

with an optically active alcohol in a homogeneous liquid phase in the presence of from 0.1 to 10 moles of a tertiary amine III per mole of ketene II and then converting the resulting ester into the acid I.

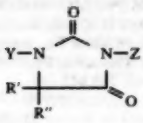
4,691,021

AMINOALKYL HYDANTOINS AND GLYCIDYL DERIVATIVES THEREOF

Pen C. Wang, Midland, Mich.; Van I. W. Stuart, Missouri City, Tex.; Ronald L. Yates, and Steven P. Crain, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 9, 1985, Ser. No. 773,960
Int. Cl.[4] C07D *405/14, 233/76*
U.S. Cl. 548—309 19 Claims

1. A compound of one of the following formulas:

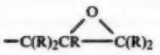


(A)

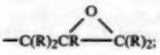
wherein R′ and R″ are independently H, lower alkyl or phenyl, and wherein Z is a moiety of the formula:

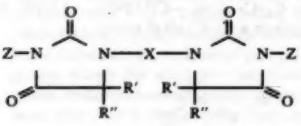
$$-C(R)_2C(R)_2N(Q)_2$$

wherein each Q independently is R or a moiety of the formula:



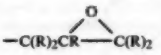
wherein each R independently is H or an aliphatic or inertly-substituted aliphatic moiety of up to about 25 carbon atoms, wherein inertness is defined as inertness with respect to reactive sites of the reagents under reaction conditions; and wherein Y is H when Q is R, but Y and Q are the same when Q is





(B)

wherein X is a divalent hydrocarbyl moiety which contains zero, one or more hetero atoms, and wherein each X is selected independently, provided that when X does not contain a hetero atom then Z contains the



group.

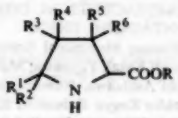
4,691,022

PROCESS FOR THE PREPARATION OF MONOCYCLIC, BICYCLIC AND TRICYCLIC AMINOACIDS

Rainer Henning, Hattersheim am Main, and Hansjörg Urbach, Kronberg/Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 623,200
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322530
Int. Cl.[4] C07C *103/52*
U.S. Cl. 548—408 7 Claims

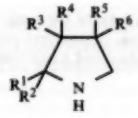
1. A process for the preparation of a compound of the formula



I

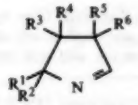
in which

R represents hydrogen, $(C_1–C_6)$-alkyl or $(C_7–C_9)$-aralkyl, and R^1 and R^3, together with the two carbon atoms bearing them, form a 4- to 8-membered saturated monocyclic or bicyclic carbocyclic ring system selected from cyclobutane, cyclopentane, cyclohexane, cycloheptane, cyclooctane, bicyclo[2.2.1]heptane or bicyclo[2.2.1]octane and the remaining radicals R^2, R^4, R^5 and R^6 are hydrogen, which process comprises converting a pyrrolidine derivative of the formula II



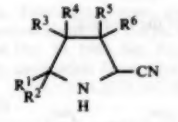
II

in which R^1 to R^6 have the same meaning as in formula I, with an ammonium, alkali metal or alkaline earth metal peroxodisulfate in the presence of a silver salt, into a Δ^1-pyrroline derivative of the formula III



III

in which R^1 to R^6 have the same meaning as in formula I, reacting the latter with hydrogen cyanide or a metal cyanide to form a compound of the formula IV



IV

in which R^1 to R^6 have the same meaning as in formula I, and reacting the latter with a compound of the formula ROH, in which R has the meaning defined above, with the formation of a compound of the formula I.

4,691,023

AMINO DISULFIDES

Dolatrai M. Vyas, Fayetteville, N.Y.; Yulin Chiang, Morristown, N.J., and Terrence W. Doyle, Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 581,291, Feb. 24, 1984, which is a continuation-in-part of Ser. No. 484,016, Apr. 11, 1983, abandoned. This application Aug. 7, 1986, Ser. No. 894,602

Int. Cl.[4] C07D *487/14;* H61K *31/40*

U.S. Cl. 548—422 1 Claim

1. The compound having the chemical name 7-[2-(4-nitrophenyldithio)ethylamino]-9a-methoxymitosane.

4,691,024

NEW MITOMYCIN DERIVATIVES, PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Kunikatsu Shirahata, Komae; Motomichi Kono; Yutaka Saito, both of Machida; Masaji Kasai, Fujisawa; Makoto Morimoto, Shizuoka, and Tadashi Ashizawa, Numazu, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Japan

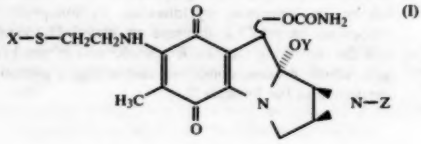
Filed Oct. 3, 1986, Ser. No. 915,949

Claims priority, application Japan, Jun. 1, 1984, 59-112428

Int. Cl.[4] C07D *487/14*

U.S. Cl. 548—422 5 Claims

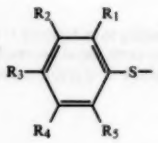
1. Mitomycin derivatives of general formula (I)



(I)

wherein Y and Z; which may be the same or different, each represents a hydrogen atom or a methyl group;

~ represents α or β bonding and x represents a group of formula (II)



(II)

wherein R_1 to R_5 are each selected from hydrogen, halogen, hydroxyl, nitro, amino, lower alkyl, lower alkoxy, lower alkylamino or lower alkanoylamino, and salts thereof.

4,691,025

BISMALEIMIDES AND PREPREG RESINS THEREFROM

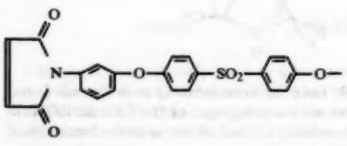
Linda A. Domeier, and Hugh C. Gardner, both of Somerville, N.J., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 22, 1983, Ser. No. 564,400

Int. Cl.[4] C08G *20/32*

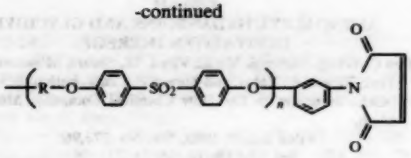
U.S. Cl. 548—521 9 Claims

1. A bismaleimide of the formula:



II

-continued



wherein n is 0 to 4 and R is the residuum of a dihydric phenol.

4,691,026

SELF- AND HYDROXYL REACTIVE FORMALDEHYDE-FREE CYCLIC HEMIAMIDAL AND HEMIAMIDE KETAL CROSSLINKING MONOMERS

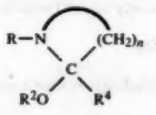
Robert K. Pinschmidt, Jr., Allentown; Dale D. Dixon, Kutztown, and William F. Burgoyne, Jr., Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 30, 1985, Ser. No. 760,442

Int. Cl.[4] C07D *207/12, 251/18, 251/46, 251/70*

U.S. Cl. 548—531 21 Claims

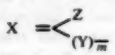
1. A compound represented by the following formula:



wherein R is an olefinically unsaturated organic radical represented by one of the following formulas

(a)

where R^5 is a C_2–C_{23} organic radical of the formula



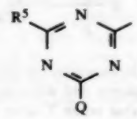
where

X is hydrogen, C_1–C_{10} alkyl, phenyl, —C(O)NH_2, or —CO_2R^8 where R^8 is hydrogen or a C_1–C_9 alkyl group,

Y is —O—, —CH_2O—, —NR^6—, —CH_2NR^6—, —(CO)—O—$(CH_2)_a$—NR^6—, where R^6 is hydrogen or a C_1–C_4 alkyl radical and a is 1 to 4, —O(CO)—, —N(CO)—, a branched or unbranched C_1 to C_8 alkylene group, or —C_6H_4—,

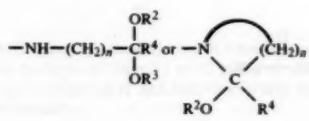
Z is hydrogen, C_1–C_4 alkyl, —C(O)NH_2, —CO_2R^7 where R^7 is hydrogen or a C_1–C_3 alkyl group,

m is 0 or 1;



(b)

where R^5 is as defined above, Q is hydrogen, hydroxy, C_1–C_4 l alkoxy or alkylamino,



-continued

$$CH_2{=}CH{-}SO_2H \quad (c)$$

where

R^2 is hydrogen or a C_1–C_4 alkyl group,

R^4 is hydrogen or a C_1–C_4 alkyl group, and

n is 3.

4,691,027

1,3-BENZOXATHIOLE DERIVATIVES

Takao Yoshioka; Eiichi Kitazawa; Mitsuo Yamazaki, and Yoshio Iizuka, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

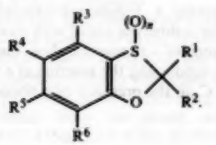
Filed Mar. 26, 1985, Ser. No. 716,171

Claims priority, application Japan, Mar. 28, 1984, 59-60198

Int. Cl.[4] C07D *327/04, 497/00*; A61K *31/39*

U.S. Cl. 549—32 **29 Claims**

1. A compound of formula (I):



(I)

in which:

R^1 represents a hydrogen atom, a C_1–C_{10} alkyl group, a substituted C_1–C_{10} alkyl group, a C_2–C_6 alkenyl group, a C_6–C_{10} carbocyclic aryl group, a substituted C_6–C_{10} carbocyclic aryl group or an alkoxycarbonyl group wherein the alkoxy parts has from 1 to 6 carbon atoms, said substituents on said alkyl and aryl groups being selected from the group consisting of:

halogen atoms, hydroxy groups, C_1–C_7 aliphatic acyloxy groups, C_6–C_{10} carbocyclic aryl carboxylic acyloxy groups, α-alkoxyalkoxy groups where both alkoxy parts have from 1 to 6 carbon atoms, a tetrahydro-2-furanyloxy- or tetrahydro-pyranyloxy group, trialkylsilyloxy groups where each alkyl part has from 1 to 6 carbon atoms, aralkyloxy groups where the aryl part is C_6–C_{10} carbocyclic aryl and the alkyl part is C_1–C_6 alkyl, C_1–C_6 alkoxy groups, C_1–C_6 aminoalkoxy groups, alkylaminoalkoxy groups where the alkyl and alkoxy parts both have from 1 to 6 carbon atoms, dialkylaminoalkoxy groups where the alkyl and alkoxy parts all have from 1 to 6 carbon atoms, carboxy groups, alkoxycarbonyl groups where the alkoxy part has from 1 to 6 carbon atoms, carbamoyl groups, alkylcarbamoyl groups where the alkyl part has from 1 to 6 carbon atoms, dialkylcarbamoyl groups where both alkyl parts have from 1 to 6 carbon atoms and, as substituents on aryl groups only, C_1–C_6 alkyl groups;

R^2 represents a hydrogen atom, a C_1–C_6 alkyl group or a C_3 or C_4 alkyl group;

R^3 represents a hydrogen atom or a C_1–C_6 alkyl group;

R^4 represents a hydroxy group, a C_1–C_{21} aliphatic acyloxy group or a C_6–C_{10} carbocyclic aryl carboxylic acyloxy group;

R^5 represents a C_1–C_{12} alkyl group, a C_1–C_6 alkoxy group, a hydroxy group, a C_1–C_7 aliphatic acyloxy group or a C_6–C_{10} carbocyclic aryl carboxylic acyloxy group;

R^6 represents a hydrogen atom, a C_1–C_6 alkyl group or a C_1–C_6 alkoxy group; and

n is 0, 1, or 2;

and pharmaceutically acceptable salts thereof.

4,691,028

TETRA-SUBSTITUTED FULVALENE DERIVATIVES

Hiroo Inokuchi, Okazaki; Gunji Saito, Chigasaki; Kazuhiko Seki, and Takehiko Mori, both of Okazaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

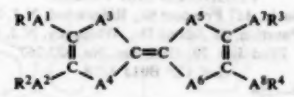
Filed Apr. 23, 1986, Ser. No. 855,105

Claims priority, application Japan, Apr. 26, 1985, 50-90604

Int. Cl.[4] C07D *317/32, 327/04, 339/06, 343/00*

U.S. Cl. 549—36 **3 Claims**

1. A fulvalene derivative represented by formula (1) below:



where A^1–A^8 are independently selected from an S atom, a Te atom, and an Se atom; and R^1–R^4 are an alkyl or alkene having 4 to 22 carbon atoms.

4,691,029

PROCESS FOR PRODUCING 3-THIENYLMALONIC ACID

Patrick C. Harris, Leatherhead, and John A. Wilcox, Capel, both of England, assignors to Beecham Group p.l.c., England

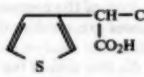
Continuation of Ser. No. 434,245, Oct. 14, 1982, abandoned, which is a continuation of Ser. No. 297,704, Aug. 31, 1981, abandoned, which is a continuation of Ser. No. 156,188, Jun. 3, 1980, abandoned. This application Aug. 16, 1984, Ser. No. 641,330

Claims priority, application United Kingdom, Jun. 19, 1979, 7921385

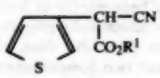
Int. Cl.[4] C07D *333/24*

U.S. Cl. 549—79 **5 Claims**

1. A hydrolytic process for the preparation in one step of 3-thienylmalonic acid from 3-thienyl cyanoacetate in enhanced yield and purity, said 3-thienylmalonic acid having the formula:



which comprises hydrolysing a compound of the formula:



wherein R^1 is alkyl or aryl, with at least a molar excess over the amount theoretically required for hydrolysis of sodium or potassium hydroxide in an aqueous solvent.

4,691,030

PROCESS FOR PREPARATION OF ALKENYLSUCCINIC ANHYDRIDES

Kiyoharu Fujino, Yokkaichi, Japan, assignor to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Dec. 13, 1985, Ser. No. 808,885

Claims priority, application Japan, Dec. 19, 1984, 59-267889

Int. Cl.[4] C07D *307/60*

U.S. Cl. 549—255 **4 Claims**

1. A process for the preparation of alkenylsuccinic anhydrides, which comprises subjecting an olefin having 2 to 90 carbon atoms and maleic anhydride to addition reaction under heating in the presence of 0.001 to 5% by weight, based on the weight of the olefin, of at least one synthetic solid acid/base

catalyst selected from the group consisting of silica/titania, silica/alumina, silica/alumina/titania, silica/alumina/iron oxide, alumina/iron oxide, silica/alumina/magnesia, and silica/-titania/iron oxide,

the amount of the maleic anhydride being 0.5 to 1.2 moles per mole of the olefin.

4,691,031

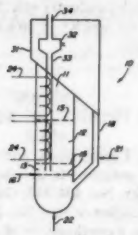
PROCESS FOR PREVENTING BACKMIXING IN A FLUIDIZED BED VESSEL

George D. Suciu, 417 Prospect St., Ridgewood, N.J. 07450, and John E. Paustian, 38 Adams Dr., Whippany, N.J. 07981

Filed Jun. 20, 1984, Ser. No. 622,767

Int. Cl.[4] B01J *8/18*

U.S. Cl. 549—258 **8 Claims**



1. A process for reacting a fluid phase in contact with solid catalyst particles in a fluidized bed contact zone, comprising:

reacting the fluid phase in contact with solid catalyst particles in a fluidized bed vessel including at least two fluidized bed compartments defined by partition means including a free flow area whereby said at least two fluidized bed compartments are in fluid flow communication with each other; maintaining the solid catalyst particles as a fluidized bed in each of the at least two compartments; passing the fluid phase through each of the compartments at a linear velocity of 2 to 50 times greater than the minimum fluidization velocity for the solid catalyst particles; passing the fluid phase through the free area of the partition means at a linear velocity of from 0.8 to 2.0 times greater than the entrainment velocity of the solid catalyst particles to thereby pass both the fluid phase and solid catalyst particles co-currently between the at least two fluidized bed compartments in substantially plug flow; separating solid catalyst particles from the fluid phase after passage through the at least two compartments; and recycling the separated solid catalyst particles for passage through the at least two compartments.

4,691,032

PROCESS FOR THE PREPARATION OF CHOLESTEROL DERIVATIVES AND NOVEL INTERMEDIATES THEREFOR

Andor Fürst, Basel; Ludwig Labler, Allschwil, and Werner Meier, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

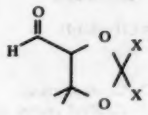
Division of Ser. No. 584,200, Feb. 27, 1984, Pat. No. 4,568,491, which is a continuation of Ser. No. 364,383, Apr. 1, 1982, abandoned. This application Nov. 1, 1985, Ser. No. 793,928

Claims priority, application Switzerland, Apr. 29, 1981, 2784/81

Int. Cl.[4] C07D *317/26*

U.S. Cl. 549—450 **3 Claims**

1. An aldehyde of the formula



III

wherein X is hydrogen or methyl.

4,691,033

PROCESS FOR PREPARING 3-PHENOXYBENZALDEHYDES

James E. Hardwicke, III, Columbia, S.C., assignor to Hardwicke Chemical Company, Elgin, S.C.

Filed Dec. 20, 1985, Ser. No. 811,403

Int. Cl.[4] C07D *317/34*

U.S. Cl. 549—453 **12 Claims**

1. In a process for preparing a 3-phenoxybenzaldehyde acetal by reacting a 3-bromobenzaldehyde acetal with an alkali metal phenolate in the presence of a copper catalyst, the improvement which comprises conducting the reaction at a temperature of about 130°–165° C. in the presence of a phenol as the sole solvent.

4,691,034

PURIFICATION OF PROPYLENE OXIDE BY TREATMENT WITH CALCIUM HYDROXIDE IN GLYCEROL OR SUGAR WATER

John R. Sanderson; William A. Smith; Edward T. Marquis, all of Austin, and Kenneth P. Keating, Georgetown, all of Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Apr. 14, 1986, Ser. No. 851,842

Int. Cl.[4] C07D *301/32*

U.S. Cl. 549—542 **18 Claims**

1. A method for removing methyl formate from propylene oxide which comprises:

contacting propylene oxide containing methyl formate with aqueous calcium hydroxide in an amount at least stoichiometrically equivalent to the methyl formate and a solubilizing amount of a solubilizing compound selected from the group consisting of sucrose, fructose, maltose, glycerol and mixtures thereof,

establishing temperature and pressure conditions which produce a reaction between methyl formate and the calcium hydroxide and

separating and recovering propylene oxide substantially free of methyl formate.

11. A method for purifying crude propylene oxide contaminated with methyl formate and aldehydes which comprises:

contacting crude propylene oxide with aqueous calcium hydroxide in an amount at least stoichiometrically equivalent to the methyl formate and a solubilizing amount of glycerol and an aldehyde scavenger selected from the group consisting of the sodium and potassium salts of bisulfite in an amount at least stoichiometrically equivalent to the aldehydes,

establishing temperature and pressure conditions which produce a reaction between methyl formate and the calcium hydroxide and

separating and recovering propylene oxide substantially free of methyl formate and aldehydes.

4,691,035
PURIFICATION OF PROPYLENE OXIDE BY TREATMENT WITH A SELECTED BASE AND INERT SALT

John R. Sanderson; Edward T. Marquis; William A. Smith, all of Austin, and Kenneth P. Keating, Georgetown, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 14, 1986, Ser. No. 851,846
Int. Cl.[4] C07D *301/32*
U.S. Cl. 549—542 21 Claims

1. A method for removing methyl formate from propylene oxide which comprises:

contacting propylene oxide containing methyl formate with a base selected from the group consisting of NaOH, KOH, LiOH, Na_3PO_4, NaHCO, $NaHCO_3$, Na_2CO_3 and K_2CO_3 in an amount at least stoichiometrically equivalent to the methyl formate and glycerol in water,

establishing temperature and pressure conditions which produce a reaction between methyl formate and the weak base and

separating and recovering propylene oxide substantially free of methyl formate.

10. A method for removing methyl formate from propylene oxide which comprises:

contacting propylene oxide containing methyl formate with a base selected from the group consisting of NaOH, KOH, LiOH, Na_3PO_4, Na_2CO_3 and K_2CO_3 in an amount at least stoichiometrically equivalent to the methyl formate; and a propylene oxide dehydrating amount of an inert salt selected from the group consisting of NaCl, NaBr, HCOONa, KCl, KBr, HCOOK, NaCHO, KCHO, Na_2SO_4 and K_2SO_4 in water,

establishing temperature and pressure conditions which produce a reaction between methyl formate and the weak base and

separating and recovering propylene oxide substantially free of methyl formate.

4,691,036
ORGANIC NICKEL COMPOUNDS, THE PRODUCTION THEREOF AND THE USE THEREOF AS POLYMERIZATION CATALYSTS

Karl-Heinz A. O. Starzewski, Bad Vilbel; Josef Witte, Cologne, and Herbert Bartl, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 18, 1986, Ser. No. 830,330
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506835
Int. Cl.[4] C07F *15/04*
U.S. Cl. 556—16 9 Claims

1. Nickel compounds produced by reacting a nickel(O) compound or a nickel compound which can be converted in situ into a nickel(O) compound with an adduct or a mixture of maleic acid anhydride and a tertiary phosphine.

4,691,037
RUTHENIUM-PHOSPHINE COMPLEX

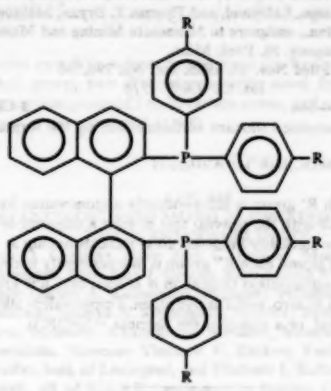
Sadao Yoshikawa; Masahiko Saburi; Takao Ikariya; Youichi Ishii, all of Tokyo, and Susumu Akutagawa, Kanagawa, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 709,869, Mar. 8, 1985, abandoned. This application Jan. 6, 1986, Ser. No. 816,689
Claims priority, application Japan, Sep. 4, 1984, 59-183875
Int. Cl.[4] C07F *15/00*
U.S. Cl. 556—18 1 Claim

1. A ruthenium-phosphine complex represented by the formula (I)

$$Ru_xH_yCl_z(R\text{—}BINAP)_p(S)_q \quad (I)$$

wherein R—BINAP represents tertiary phosphine represented by the formula (II)


(II)

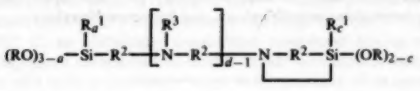
R which is the same represents hydrogen, methyl or t-butyl, S represents a tertiary amine selected from the group consisting of triethylamine, tri-n-butylamine, tri-n-octylamine, N-methyl piperidine, N-methyl pyrrolidine, N-methyl morpholine, pyridine, dimethyl aniline and tetramethyl ethylenediamine, y represents 0 or 1, and when y is 0, x represents 2, z represents 4 and p represents 1, and when y is 1, x represents 1, z represents 1 and p represents 0.

4,691,038
NOVEL ROOM TEMPERATURE VULCANIZABLE POLYDIORGANOSILOXANE COMPOSITIONS

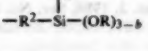
Eric R. Pohl, Tarrytown, and Enrico J. Pepe, Amawalk, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 748,357, Jun. 24, 1985. This application Oct. 16, 1986, Ser. No. 919,653
Int. Cl.[4] C07F *7/10, 7/18*
U.S. Cl. 556—407 8 Claims

1. A poly(alkoxysilylalkyl)amine of the formula



wherein
R is C_1–C_4 alkyl;
R^1 is hydrogen, C_1–C_6 alkyl or C_6–C_{12} aryl;
R^2 is C_3–C_8 alkylene, C_6–C_{12} arylene or C_7–C_{14} alkarylene,
R^3 is hydrogen, C_1–C_6 alkyl, C_6–C_{12} aryl or



wherein
R, R^1 and R^2 are as defined above;
a and b are 0, 1 or 2
c is 0 or 1, and
d is 1, 2 or 3.

4,691,039

ETHOXYLATED SILOXANE SURFACTANTS AND HYDROPHILIC SILICONES PREPARED THEREWITH

Steven M. Aasen, Lakeland, and Thomas T. Bryan, Mahtomedi, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 15, 1985, Ser. No. 798,738
Int. Cl.[4] C07F 7/18
U.S. Cl. 556—446 3 Claims

1. An ethoxylated siloxane surfactant having the formula:

$$(R'O)_3Si(OC_2H_3R'')_m(OC_3H_6)_nOT$$

wherein each R′ group is independently a monovalent hydrocarbyl radical with the proviso that at least a majority of said R′ groups are sterically hindered alkyl radicals having at least three carbon atoms, each R″ group is independently hydrogen or a lower hydroxyalkyl radical, m is at least one, n is greater than or equal to zero, and T is hydrogen, a monovalent alkyl or alkenyl radical, or a group of the formula —$Si(OR')_3$.

4,691,040

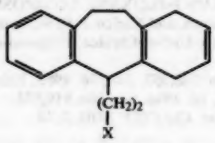
DERIVATIVES OF 10,11-DIHYDRO-5H-DIBENZO[A,D]CYCLOHEPTENE-5-ETHANOL

Werner Aschwanden, Ettingen; Quirico Branca, Basel; Emilio Kyburz, Reinach, and Rudolf Pfister, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 330,733, Dec. 14, 1981, Pat. No. 4,513,002.
This application Feb. 5, 1985, Ser. No. 698,493
Claims priority, application Switzerland, Jan. 16, 1981, 273/81
Int. Cl.[4] C07C 21/24, 143/02, 143/40, 143/26
U.S. Cl. 558—44 2 Claims

1. A compound of the formula

III



wherein X is selected from the group consisting of chlorine, bromine, iodine, methanesulfonyloxy, p-toluenesulfonyloxy, p-bromobenzenesulfonyloxy, and benzenesulfonyloxy.

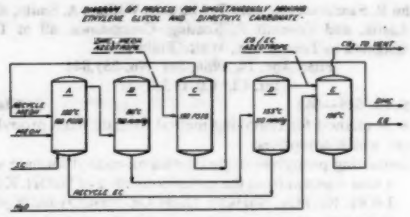
4,691,041

PROCESS FOR PRODUCTION OF ETHYLENE GLYCOL AND DIMETHYL CARBONATE

Roger G. Duranleau, Georgetown; Edward C. Y. Nieh, and John F. Knifton, both of Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 3, 1986, Ser. No. 815,954
Int. Cl.[4] C07C 68/00, 29/128, 31/20
U.S. Cl. 558—277 11 Claims

1. A process for producing ethylene glycol and dimethyl carbonate by reacting ethylene carbonate and methanol in the presence of a heterogeneous catalyst selected from the group consisting of ion exchange resins with quaternary ammonium functional groups, ion exchange resins with sulfonic, acid functional groups, ion exchange resins with carboxylic acid functional groups, alkali and alkaline earth silicates impregnated into silica, and ammonium exchanged zeolites, at a temperature of 0° to 150° C. until the desired products are formed.



4,691,042

PREPARATION OF MONOALKYLATED DIHYDROXYBENZENES AND NOVEL COMPOUNDS PREPARED THEREBY

Abel Mendoza, and Eric W. Otterbacher, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 614,503, May 29, 1984, which is a continuation-in-part of Ser. No. 507,448, Jun. 24, 1983. This application Oct. 9, 1985, Ser. No. 785,821
Int. Cl.[4] C07C 69/76
U.S. Cl. 560—61 1 Claim

1. 2-Ethoxyethyl 2-(4-(1-methylethenyl)phenoxy)propanoate.

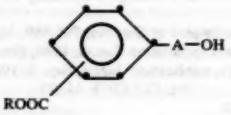
4,691,043

BENZOIC ACID DERIVATIVES PROCESS FOR PREPARATION AND APPLICATION AS DRUGS, DISINFECTANTS OR PRESERVATIVES

Henri Demarne; Robert Filhol, and Madeleine Mosse, all of Montpellier, France, assignors to Sanofi, Paris, France

Continuation of Ser. No. 640,108, Aug. 13, 1984, abandoned.
This application Jan. 7, 1986, Ser. No. 816,978
Claims priority, application France, Aug. 18, 1983, 83 13445
Int. Cl.[4] C07C 69/76
U.S. Cl. 560—064 10 Claims

1. A compound of the formula



wherein A represents a straight or branched alkyl chain with 5 to 10 carbon atoms, and R represents hydrogen, or an aklyl or hydroxyalkyl group with 2 to 6 carbon atoms, and salts thereof when R represents hydrogen.

4,691,044

ANTIOXIDANTS FOR ORGANIC MATERIALS

Samuel Evans, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

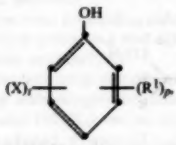
Filed Aug. 28, 1985, Ser. No. 770,049

Claims priority, application Switzerland, Sep. 3, 1984, 4203/84

Int. Cl.⁴ C07C *69/76*

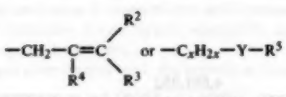
U.S. Cl. 560—75 **11 Claims**

1. A mixture of substances obtainable by reacting elementary sulfur with compounds of the formula I

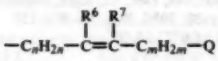


(I)

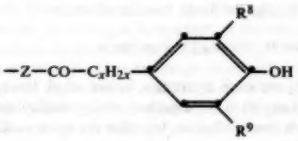
in which R^1 is C_1–C_{12}–alkyl, C_5–C_7–cycloalkyl, phenyl,-naphthyl, 2-naphthyl, C_7–C_9–aralkyl or C_7–C_9–alkaryl, t is 1, 2 or 3, p is O, 1 or 2 and X is one of the groups



in which R^2, R^3 and R^4 independently of one another are hydrogen or methyl, xi O 1, 2 or 3, Y is —CO—O—or —CO—NH—and R^5 is a radical



in which n and m independently of one another are integral values from O to 14, R^6 and R^7 are hydrogen or C_1–C_8–alkyl, and Q is hydrogen, methyl or a radical



in which Z is —O—or —NH—and R^8 and R^9 independently of one another are as defined for R^1 or are hydrogen

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4,691,045

HYDROXYL GROUP-CONTAINING (METH)ACRYLATE OLIGOMER, PREPOLYMER THEREFROM, AND METHOD FOR USE THEREOF

Shuzo Fukuchi, and Shigeru Yamaguchi, both of Himeji, Japan, assignors to Nippon Shokubai Kagaku Co., Ltd., Japan

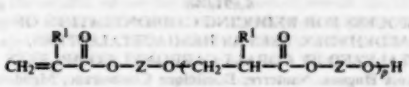
Filed Dec. 5, 1985, Ser. No. 805,342

Claims priority, application Japan, Dec. 6, 1984, 59-256558; Feb. 26, 1985, 60-35350; Jul. 8, 1985, 60-148374; Oct. 2, 1985, 60-218037; Oct. 29, 1985, 60-240661

Int. Cl.⁴ C08F *20/26*

U.S. Cl. 560—185 **22 Claims**

1. A hydroxyl group-containing (meth)acrylate oligomer represented by the general formula I:



(I)

wherein two R^1's independently stand for hydrogen atom or methyl group, two Z's independently stand for a divalent hydrocarbon group of 2 to 20 carbon atoms, and p stands for an integer of the value of 1 to 100.

4,691,046

BUTANEDIOIC ACID MONO [(2-DIMETHYLAMINO] ETHYL ESTER)SUCCINATE

Miron O. Lozinsky, Kiev; Jury G. Bobkov, Moscow; Alla F. Shinanjuk, Kiev; Jury I. Gevaza, Kiev; Leonid N. Markovsky, Kiev; Galina A. Kuznetsova, Moscow; Valentin A. Markin, Moscow; Natalya N. Kleimenova, Moscow; Antonina I. Tentsova, Moscow; Alexandr N. Motalov, Moscow; Sergei B. Seredinin, Moscow; Vladimir F. Katkov; Vasily M. Vinogradov, both of Leningrad, and Vladimir I. Kulinsky, Krasnoyarsk, all of U.S.S.R., assignors to Institut Organicheskoi Khimii Ordena Lenina I Ordena Druzhby Narodov Akademii Nauk Ukrainskoi SSR, Kiev and Instiut Farmakologii Akademii Meditsinskikh Nauk SSSR, Moscow, both of, U.S.S.R.

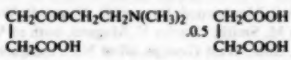
Filed Jan. 2, 1987, Ser. No. 207

Claims priority, application U.S.S.R., Jan. 8, 1986, 4007025

Int. Cl.⁴ C07C *69/34*

U.S. Cl. 560—196 **1 Claim**

1. Butanedioic acid mono[(2-dimethylamino)ethyl ester]succinate of the formula:



4,691,047

PREPARATION OF CARBOXYLIC DI-ESTERS OR ACIDS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 26, 1986, Ser. No. 844,429

Claims priority, application United Kingdom, Apr. 15, 1985, 8509641

Int. Cl.⁴ C07C *67/38, 51/14*

U.S. Cl. 560—204 **14 Claims**

1. A process for the production of carboxylic di-esters, dicarboxylic acids or mixtures thereof, which process comprises reacting at a temperature in the range of from 50° C. to 200° C. an olefinically unsaturated compound having two conjugated carbon-carbon double bonds with carbon monoxide and with an alcohol or water in the presence of an aprotic solvent and a dissolved catalytic system prepared by combining:

(a) a divalent palladium compound,

(b) an organic phosphine of the formula

(I)

in which R^1, R^2 and R^3 each individually represent an aryl group, optionally substituted with one or more electron-with-drawing substituents, at least 5 gram atom of trivalent phosphorus per gram atom of divalent palladium being present in the catalytic system, and

(c) at least one mol of hydrogen chloride per atom of trivalent phosphorus present in the catalytic system.

4,691,048

PROCESS FOR REDUCING CARBONYLATION OF ALDEHYDES, USES AS HEMIACETALESTERS, CATALYZED BY COBALT CARBONYL COMPLEXES

Francois Hugues, Nanterre; Dominique Commereuc, Meudon, and Yves Chauvin, Le Pecq, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

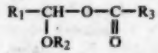
Filed May 10, 1985, Ser. No. 732,487

Claims priority, application France, May 11, 1984, 84 07280

Int. Cl.[4] C07C *67/24*

U.S. Cl. 560—240 **9 Claims**

1. A process for the reducing carbonylation of hemiacetalesters comprising reacting a hemiacetalester with a gas containing hydrogen and carbon monoxide at a temperature is from 70° to 250° C. in the presence of a cobalt carbonyl complex, wherein the hemiacetalester has the formula:



and R_1, R_2 and R_3 each independently are hydrogen, C_{1-12}-alkyl, C_{6-14}-aryl, C_{7-14}-aralkyl, or C_{3-12}-cycloalkyl.

4,691,049

PROCESS FOR PREPARING A SPECIFIC DIASTEREOMER OF A MONOAMINO DICARBOXYLIC ACID ESTER

Ronald J. Doll, Maplewood; Bernard R. Neustadt, West Orange; Elizabeth M. Smith; Charles V. Magatti, both of Verona, and Elijah H. Gold, West Orange, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 651,378, Sep. 17, 1984, Pat. No. 4,584,285, which is a continuation-in-part of Ser. No. 500,494, Jun. 2, 1983, abandoned. This application Feb. 20, 1986, Ser. No. 831,383

Int. Cl.[4] C07C *103/52*

U.S. Cl. 562—553 **3 Claims**

1. A process for the preparation of a single diastereomer of an monoamino dicarboxylic acid which comprises reacting an α-aminoacid ester with a lower alkyl or benzyl ester of a specific diastereomer of 2(trifluoromethanesulfonyloxy) propionic acid at room temperature in an inert solvent in the presence of a base to obtain the corresponding lower alkyl or benzyl ester of the resulting monoamino dicarboxylic acid as a specific diastereomer.

4,691,050

CARBONYLATION PROCESS FOR THE PRODUCTION OF AROMATIC DICARBOXYLIC ACIDS

Carl M. Lentz, Mt. Carmel; James R. Overton, and David D. Cornell, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 707,286, Mar. 1, 1985, abandoned. This application May 23, 1986, Ser. No. 868,178

Int. Cl.[4] C07C *51/10*

U.S. Cl. 562—406 **8 Claims**

1. A process for the preparation of aromatic dicarboxylic acids which comprises reacting an aromatic diiodide having about 5 to about 20 atoms in the ring or rings thereof, with carbon monoxide in the presence of a soluble homogeneous rhodium catablyst in a reaction medium selected from acetic acid, butyric acid and propionic acid.

4,691,051

ADAMANTYL PHENYL β-ALANINES

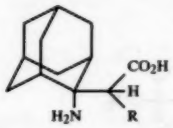
Vassil S. Georgiev, Rochester, and George B. Mullen, Avon, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 691,104, Jan. 4, 1985, abandoned. This application Jun. 4, 1986, Ser. No. 870,553

Int. Cl.[4] C07C *101/08*

U.S. Cl. 562—443 **3 Claims**

1. Adamantyl phenyl β-alanines having the structure:



where R is phenyl or phenyl substituted with oxyalkyls having from 1 to 8 cabon atoms.

4,691,052

PROCESS FOR THE PREPARATION OF PYRETHROID ACIDS

William T. Brady, Sanger; Scott J. Norton, Argyle, and Jinrea Ko, Denton, all of Tex., assignors to S.C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 560,449, Dec. 12, 1983, abandoned. This application May 30, 1986, Ser. No. 871,153

Int. Cl.[4] C07C *51/00*

U.S. Cl. 562—506 **3 Claims**

2. Process for preparing vinyl-substituted cyclopropanecarboxylic acids comprising:

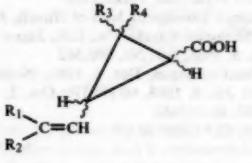
(a) forming a dihalo-vinylcyclobutanone addition product from the reaction of a dihaloketene and a conjugated diene of the Formula A in the presence of phosphoryl chloride, wherein the conjugated diene has the structure

$R_1R_2C{=}CHCH{=}CR_3R_4$ TM Formula A

wherein R_1 R_2 are each hydrogen, lower alkyl, lower carboxy, lower akoxyalkyl or, together, are cycloalkyl and R_3 and R_4 are each lower alkyl or, together are spiro $-(CH_2)_n$, where n=2–6;

(b) reacting said dihalo-vinylcyclobutanone addition product with up to one equivalent of dehalogenating reducing agent to reduce said addition product to its corresponding monohalo-vinylcyclobutanone, wherein the dehalogenating reducing agent is zinc dust and acetic acid; and

(c) reacting said monohalo-vinylcyclobutanone product with a base for inducing ring contraction to form a corresponding vinyl-substituted cyclopropanecarboxylic acid product of a structural Formula B:



Formula B

wherein, R_1 R_2 R_3 and R_4 are as before.

4,691,053

PROCESS FOR PRODUCING ORGANIC COMPOUNDS BY UTILIZING OXYGENIC COMPLEXES

Mutsuo Yamada; Yasuyuki Nishimura; Yoshijiro Arikawa; Takanori Kuwahara; Taiji Kamiguchi, and Hirotoshi Tanimoto, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 617,187

Claims priority, application Japan, Jun. 3, 1983, 58-99022; Feb. 29, 1984, 59-38137

Int. Cl.[4] C07C *45/38, 51/235, 51/255, 45/39, 45/34;* C07D *307/89, 307/34;* B01J *31/18*

U.S. Cl. 562—531 9 Claims

1. A process for oxiding aldehydes to produce organic acids comprising contacting said aldehyde with an oxidizing agent consisting essentially of:

a transition metal complex ($M_mX_nL_l$) capable of coordinating with oxygen, consisting of a transition metal compound (M_mX_n) and an organic phosphorus compound L as a ligand, wherein M is a transition metal belonging to at least one group selected from the group consisting of Group I, Groups IV–VII and the iron group in Group VIII of the Periodic Table; X represents an anion; ligand L represents an organic phosphorous compound; m and n represent the number of atoms of said transition metal M and said anion X respectively; and l represents the number of molecules of said ligand, wherein m, n, and l are in the range of 1 to 4; and,

oxygen coordinated with the transition metal complex.

4,691,054

METHOD FOR SEPARATING A BASIC AMINO ACID

Takafumi Tosa, Kawasaki; Yoshihiro Koga, and Tsutomu Matsuishi, both of Saga, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Sep. 9, 1986, Ser. No. 905,126

Claims priority, application Japan, Sep. 13, 1985, 60-202702

Int. Cl.[4] C07C *99/12*

U.S. Cl. 562—554 8 Claims

1. A method for separating a basic amino acid from a liquor containing the safe, which comprises:

(a) contacting the basic amino acid containing liquor with a strongly acidic cation exchange resin at a pH at which the basic amino acid exists in the form of a divalent cation, thereby adsorbing at least a part of the basic amino acid in the form of the divalent cation;

(b) contacting said ion exchange resin with a liquor containing said basic amino acid and a neutral amino acid or an acidic amino acid or both at a pH at which the basic amino acid exists in the form of a monovalent cation;

(c) passing an eluant through said ion exchange resin, thereby eluting the basic amino acid from the ion exchange resin; and

(d) separating and recovering the basic amino acid from the eluate.

4,691,055

CONCENTRATION OF ORGANIC CHEMICALS FROM DILUTE AQUEOUS SOLUTIONS

Branko Urbas, Darien, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Dec. 7, 1981, Ser. No. 327,849

Int. Cl.[4] C07C *59/08*

U.S. Cl. 562—589 19 Claims

1. A process for concentrating a dilute aqueous solution of an organic compound which is readily adsorbed from solution by activated carbon and which can be desorbed by vapors of a volatile solvent by adsorbing the organic compound on an adsorbent carbon, eluting the organic compound from the carbon with a volatile solvent that distills at a temperature below the boiling point of the organic compound, and separating the volatile solvent from the mixture of solvent and eluted organic compound, wherein the improvement comprises

applying vapors of the volatile solvent to a bed of the carbon, said bed being maintained at a temperature at or slightly below the condensation temperature of the solvent, at a rate of less than about one-half bed volume per hour until the volatile solvent is detected in the eluate,

continuing to apply said vapors until about one-half bed volume of eluate containing a concentrated aqueous solution of the organic compound in the volatile solvent is collected, and

evaporating the volatile solvent from said one-half bed volume of eluate to obtain an aqeous solution of the organic compound containing at least about 30% of the organic compound by weight.

4,691,056

3-HALOGENOACETONESULFONAMIDES AND A PROCESS FOR THEIR PREPARATION

Dieter Günther, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

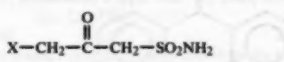
Filed Sep. 4, 1986, Ser. No. 904,049

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1985, 3531788

Int. Cl.[4] C07C *143/74*

U.S. Cl. 564—96 3 Claims

1. A compound of the formula



in which X can be fluorine, chlorine, bromine or iodine.

4,691,057

PROCESS FOR MAKING ALKALI METAL ARYLOXIDES

Allan A. Eisenbraun, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 19, 1984, Ser. No. 652,099

Int. Cl.[4] C07C *103/38;* C07F *9/00*

U.S. Cl. 564—223 11 Claims

1. A process for making an alkali metal aryloxide, said process comprising reacting an alkali metal with an aromatic hydroxy compound in the presence of a promoter amount of a lower alcohol.

4,691,058

PROCESS FOR PRODUCING 1-HYDROXY KETONES

Werner Stegmann, Liestal, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

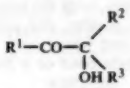
Continuation of Ser. No. 488,936, Apr. 27, 1983, abandoned. This application Feb. 14, 1985, Ser. No. 701,792

Claims priority, application Switzerland, May 7, 1982, 2842/82

Int. Cl.[4] C07C *45/64*

U.S. Cl. 568—316 11 Claims

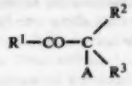
1. A process for producing a compound of the formula I



(I)

in which R^1 is phenyl or said phenyl substituted by straight-chain or branched-chain C_1-C_4-alkyl groups, R^2 and R^3 are identical or different, and are each a straight-chain or branched chain C_1–C_5-alkyl group, or a C_5–C_8-cycloalkyl or said cycloalkyl substituted by 1 to 3 straight-chain or branched chain C_1–C_5-alkyl groups, or together with the C atom to which they are bound they form a C_5–C_8-cycloalkyl or said cycloal-

kyl substituted by 1 to 3 straight-chain or branched-chain C_1–C_4-alkyl groups, which process comprises reacting a compound of formula II



(II)

in which R^1, R^2 and R^3 are as defined above, and A is chlorine or bromine, with a compound releasing hydroxide ions, in the presence of water or in the presence of water and an inert organic solvent, by the phase-transfer catalysis method, whereby the compound of the formula II is present in solution or in the melted form.

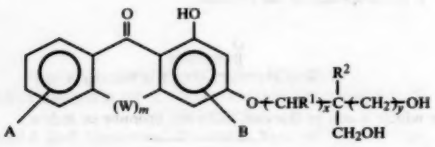
4,691,059

COPOLYMERIZABLE UV STABILIZERS

Sumita B. Mitra, and Smarajit Mitra, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 30, 1985, Ser. No. 771,307
Int. Cl.[4] C07C *49/786*
U.S. Cl. 568—333 **3 Claims**

1. A monomer having the formula



wherein

R^1 and R^2 are the same or different and each is selected from the group consisting of hydrogen, and alkyl, alkoxylalkyl, aryl, aryloxyalkyl, aralkyl, and alkaryl groups, which can be substituted by a non proton-donating group selected from the group consisting of halogen, nitro, cyano, aldehyde group, acyl group having 1 to 10 carbon atoms, and an aroyl group having 6 to 10 carbon atoms, or R^1 and R^2 together can form an aliphatic cyclic structure of 5 to 7 atoms which can include carbon and zero to two non-connected oxygen atoms, wherein R^1 and R^2 together total from zero to forty carbon atoms;

x is an integer from 0 to 20,

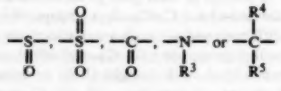
y is 0 or 1, provided that both x and y are not zero;

m is 0 or 1;

A and B are the same or different and represent one to eight monovalent substituents on the aromatic rings selected from the class consisting of (1) hydrogen, halide, nitro, tertiary amino, amido, and cyano, and (2) alkyl, alkenyl, aryl, aralkyl, alkaryl, alkoxy, aryloxy, aralkyloxy, alkaryloxy, aryloxyalkyl, and thioalkyl, these groups having 1 to 20 carbon atoms and up to 6 non-connected oxygen and sulfur atoms and can be substituted by halogen, nitro, tertiary amino, cyano, and amido groups; or A and B can be linked to said aromatic rings by divalent keto, sulfoxide, and sulfone groups, with the proviso that when

m=—O—, W is not present, and then a benzophenone structure is present, and when

m=1, then W is a single bond or a divalent group group —O—, —S—,



in which R^3 is alkyl, alkoxyalkyl, aryl, aryloxyalkyl, alkoxyaryl, aralkyl, or alkaryl group, which can be substituted by a non proton-donating group selected from the group consisting of halogen, nitro, cyano, aldehyde group, acyl group having 1 to 10 carbon atoms, and an aroyl group having 6 to 10 carbon atoms; and

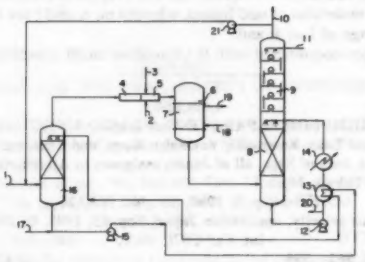
R^4 and R^5 independently are the same as R^1 and R^2 which are defined above.

4,691,060

PROCESS FOR RECOVERING WASTE HEAT FROM FORMALDEHYDE PRODUCT GAS

Shigeo Kimura, Nagoya, and Kouichi Kurata, Mie, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 825,767, Feb. 3, 1986, abandoned, which is a continuation of Ser. No. 669,174, Nov. 7, 1984. This application Nov. 25, 1986, Ser. No. 931,990
Int. Cl.[4] C07C *47/052*
U.S. Cl. 568—420 **3 Claims**



1. A process for producing formaldehyde which comprises reacting a feed gas mixture comprising methanol, steam and air in the presence of a silver catalyst; heat exchanging a resulting hot formaldehyde containing product gas with pressurized water in a waste heat boiler, thereby generating steam; flowing the product gas to a formaldehyde absorption column and absorbing formaldehyde into an aqueous solution at the bottom of the absorption column; heat exchanging the aqueous formaldehyde-containing solution with water, thereby obtaining hot water; and introducing the hot water and feed air into a feed gas humidifier, the heated water being introduced into the top of the gas humidifier to thereby contact the hot water with the feed air by a gas liquid countercurrent and vaporizing the hot water into the feed air.

4,691,061

OXIDATION OF ACETOVANTILLONE TO VANILLIN

Bill S. K. Fung, Renton, and Bjorn F. Hrutfiord, Seattle, both of Wash., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 10, 1986, Ser. No. 905,618
Int. Cl.[4] C07C *45/32*
U.S. Cl. 568—432 **15 Claims**

1. A process for the production of vanillin comprising contacting (a) p-hydroxy aromatic 1-carbonyl compounds comprising substantially acetovanillone, (b) oxygen and (c) alkaline material.

4,691,062

PROCESS FOR THE PRODUCTION OF 4-CHLORO-BUTANALS

Juan Andrade, Kleinostheim; Gunter Prescher, Hanau, and Klaus Kohler, Hainburg, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

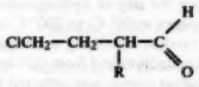
Filed Oct. 22, 1986, Ser. No. 921,474

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1985, 3537815

Int. Cl.[4] C07C 45/42

U.S. Cl. 568—495 6 Claims

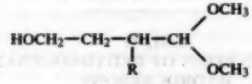
1. A process for the production of a 4-chloro-butanal of the formula



(I)

wherein R is hydrogen or a 1 to 4 carbon atom alkyl comprising

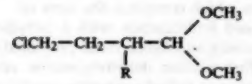
(a) reacting a 1,1-dimethoxy-4-hydroxybutane of the formula



(II)

at a temperature between −20° and +80° C. with a 1.0 to 10 fold molar amount of carbon tetrachloride in the presence of a 0.1 to 20 fold molar amount of triphenylphosphine and

(b) hydrolyzing in acid medium the 1,1-dimethoxy-4-chlorobutane formed of the formula



(III)

4,691,063

ISOMERIZATION OF CRESOLS

Dusan J. Engel, Des Plaines, Ill., and Jean-Pierre Gilson, Columbia, Md., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 16, 1986, Ser. No. 874,780

Int. Cl.[4] C07C 37/48, 39/06

U.S. Cl. 568—783 8 Claims

1. A process for the isomerization of a cresol selected from the group consisting of o-cresol and m-cresol which comprises contacting said cresol in the vapor phase with an acidic phosphorous-containing crystalline zeolite catalyst at isomerization conditions and recovering the resultant isomers.

4,691,064

METHOD FOR PRODUCING CYCLOALKANOLS

Tamio Shirafuji, and Itaru Kawata, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 12, 1986, Ser. No. 929,512

Claims priority, application Japan, Nov. 22, 1985, 60-262853

Int. Cl.[4] C07C 35/06, 35/08, 35/20

U.S. Cl. 568—835 9 Claims

1. A method for producing cycloalkanols which comprises carrying out the catalytic hydration of a cycloalkene having from 5 to 8 carbon atoms with water using as a catalyst an aromatic sulfonic acid having at least one hydroxyl or ether group at a temperature in the range from about 30° C. to about 200° C., and separating the resulting cycloalkanol from the reaction solution by extraction.

4,691,065

CHLOROTRIFLUOROETHYLENE TELOMERIZATION PROCESS

Bobby F. Daniels, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Nov. 2, 1983, Ser. No. 548,111

Int. Cl.[4] C07C 17/26

U.S. Cl. 570—139 11 Claims

1. A process for preparing a distribution of telomers of chlorotrifluoroethylene of general formula $CCl_3(CF_2CFCl)_nCl$, where n is from about 1 to about 20, consisting essentially of reacting chlorotrifluoroethylene with carbon tetrachloride in the presence of a catalytic amount of $CuCl_2$ and iron, said reaction being conducted in a solvent at a temperature of from about 90° C. to about 150° C.

4,691,066

PROCESS OF PREPARING METACHLOROBENZOTRIFLUORIDE

Fumio Inoue, Sakado; Yutaka Katsuhara, Kawagoe, and Koshi Okazaki, Saitama, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Continuation of Ser. No. 503,169, Jun. 10, 1983, abandoned. This application Mar. 11, 1985, Ser. No. 709,370

Claims priority, application Japan, Jun. 18, 1982, 57-104004

Int. Cl.[4] C07C 17/12

U.S. Cl. 570—144 3 Claims

1. A process of preparing m-chlorobenzotrifluoride by reacting benzotrifluoride and chlorine in the presence of a catalyst with a selectivity sufficient to produce a ratio of m-chlorobenzotrifluoride to p-chlorobenzotrifluoride product of at least about 14, wherein said catalyst comprises a combination of at least one metal chloride selected from the group consisting of iron trichloride, gallium trichloride, antimony pentachloride, niobium pentachloride and tantalum pentachloride, and iodine, said at least one metal chloride and said iodine being present in amounts of at least 0.007 mole and at least 0.002 mole, respectively, per mole of benzotrifluoride, and wherein the reaction is maintained at a temperature of from about 0° to about 40° C., and the mole ratio of chlorine to benzotrifluoride does not exceed about 1.0.

4,691,067

CATALYTIC PROCESS FOR COUPLING TELOMERS OF CHLOROTRIFLUOROETHYLENE

Johny S. Ng, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,884

Int. Cl.[4] C07C 17/26

U.S. Cl. 570—153 12 Claims

1. A process for coupling two low molecular weight chlorotrifluoroethylene telomers, each telomer having the general formula $CCl_3(CF_2CFCl)_nCl$, where n is one or two, to form a perchlorofluoroolefin of higher molecular weight, said process consisting essentially of reacting said telomers with hydrogen in the presence of an effective amount of a catalyst selected from the group consisting of platinum, palladium, rhodium, ruthenium, Raney nickel, Raney cobalt, and mixtures thereof.

4,691,068

PROCESS FOR PRODUCTION OF ALKYL AROMATICS

Kyle W. Resh, Baltimore, Md., assignor to Vista Chemical Company, Houston, Tex.

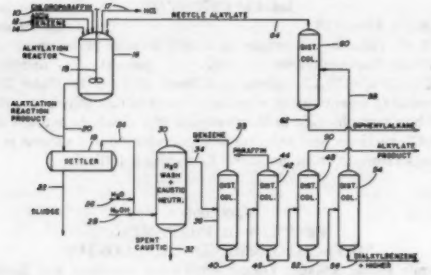
Filed Aug. 1, 1986, Ser. No. 893,047

Int. Cl.[4] C07C 1/00

U.S. Cl. 585—323 8 Claims

1. In a process for the production of a mono alkyl aromatic wherein a mono nuclear aromatic compound and an alkylating

agent are subjected to an alkylation reaction to produce a reaction product comprising unreacted mono nuclear aromatic compound, alkanes, mono alkyl aromatic, dialkyl aromatic and by-products, said reaction product being treated to remove unreacted mono nuclear aromatic compound and paraffins, and produce a crude product stream containing mono alkyl aromatic, dialkyl aromatic and color forming by-products, and wherein the majority of said mono alkyl aromatic is separated



from said crude product stream to produce a higher boiling fraction containing a minor amount of mono alkyl aromatic, dialkyl aromatic and said color forming by-products, the improvement comprising separating said higher boiling fraction into a recycle stream containing mono alkyl aromatic and at least some of said color forming by-product and a co-product stream substantially free of said mono alkyl aromatic, and introducing said recycle stream into said alkylation reaction.

4,691,069

HYDROGENTATION OF UNSATURATED ALIPHATIC HYDROCARBONS

Michel O. Albers, and Eric Singleton, both of Pretoria, South Africa, assignors to South African Inventions Development Corporation, Pretoria, South Africa

Filed Feb. 19, 1986, Ser. No. 831,006

Claims priority, application South Africa, Feb. 26, 1985, 85/1445

Int. Cl.[4] C07C *5/03*

U.S. Cl. 585—259 **26 Claims**

1. A process for the hydrogenation of an unsaturated aliphatic hydrocarbon which comprises bringing an unsaturated aliphatic hydrocarbon to be hydrogenated into contact with hydrogen in the presence of a catalyst which comprises cations selected from the group consisting in five-coordinate and six-coordinate complex cations of ruthenium (II) having the general formula (1):

$$(RuXL_n)^+ \quad (1)$$

in which

Ru is a ruthenium moiety;

X is a radical coordinated with the Ru;

L is a donor ligand; and

n is an integer not greater than 5.

4,691,070

CATALYST, ITS METHOD OF PREPARATION AND PROCESS FOR ITS USE IN THE HYDROGENATION OF DIOLEFINS

Teiji Nakamura; Eiichiro Nishikawa, both of Saitama, and Takeo Koyama, Kanagawa, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 750,367, Jun. 28, 1985, abandoned. This application Nov. 20, 1986, Ser. No. 932,644

Claims priority, application Japan, Jun. 28, 1984, 59-131930

Int. Cl.[4] C07C *5/05*

U.S. Cl. 585—273 **6 Claims**

1. A method for the hydrogenation of a cyclic diolefin selected for the group consisting of cyclopentadiene, cyclohexadiene and 1,3-cyclooctadiene to a corresponding cyclic monoolefin comprising the step of hydrogenating said diolefin in a hydrogen atmosphere at 50° C. to 200° C. and in the presence of a supported catalyst consisting essentially of from 0.01 to 10% by weight of palladium and from 0.01 to 5% by weight of at least one co-catalyst component selected from the group consisting of ruthenium, rhodium, cobalt, and rhenium said % by weight based on the total weight of the catalyst and support, said support being a non-acidic inorganic compound having a surface area of not more than 100 m^2/g, the weight ratio of said co-catalyst metal to the palladium metal being from 0.14 to 5.0.

4,691,071

DEHYDROGENATION OF DEHYDROGENATABLE HYDROCARBONS

Jeffery C. Bricker, Buffalo Grove, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 11, 1986, Ser. No. 940,665

Int. Cl.[4] C07C *1/00*

U.S. Cl. 585—319 **19 Claims**

1. In a process for the dehydrogenation of a dehydrogenatable hydrocarbon with separate and intermediate selective oxidation of hydrogen which comprises the steps of:

(a) contacting said hydrocarbon with a dehydrogenation catalyst comprising an alkaline metal-promoted iron compound in a first-reaction dehydrogenation zone in the presence of steam at dehydrogenation conditions to produce a first-reaction dehydrogenation zone effluent stream comprising a mixture of unconverted hydrocarbons, dehydrogenated hydrocarbons, hydrogen and steam;

(b) removing said first-reaction dehydrogenation zone effluent from said first-reaction dehydrogenation zone;

(c) passing said effluent of step (b) to a second-reaction oxidation zone, which is separate and discrete from said first-reaction dehydrogenation zone;

(d) contacting said first-reaction dehydrogenation zone effluent in said second-reaction oxidation zone with an oxygen-containing gas to selectively oxidize said hydrogen within said first-reaction zone effluent to the substantial exclusion of oxidation of unconverted and dehydrogenated hydrocarbons in the presence of an oxidation catalyst consisting essentially of a Group VIII noble metal, a Group IVA metal and a Group IA or IIA metal composited on a metal oxide support at oxidation conditions wherein the exothermic selective oxidation of said hydrogen provides additional heat and thereby raises the temperature of said unconverted and dehydrogenated hydrocarbons;

(e) withdrawing said unconverted and dehydrogenated hydrocarbons from said second-reaction oxidation zone having an increased temperature with respect to the temperature of said first-reaction dehydrogenation zone effluent;

(f) passing said removed second-reaction oxidation zone product stream of step (e) to a third-reaction dehydrogenation zone containing a dehydrogenation catalyst comprising an alkaline metalpromoted iron compound at de-

hydrogenation conditions to produce dehydrogenated hydrocarbons; and,

(g) withdrawing and recovering said dehydrogenated hydrocarbons, the improvement which comprises utilizing as said support a cerium-containing alumina.

4,691,072

POLYMERIZATION OF ISOBUTYLENE

Hans Schick, Mannheim; Erich Kolk, Bad Durkheim; Karl-Heinz Fauth, Wattenheim, and Heinrich Mohr, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 22, 1986, Ser. No. 887,938

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1985, 3527551

Int. Cl.[4] C07C *2/08*

U.S. Cl. 585—525 **2 Claims**

1. A process for increasing the conversion of isobutylene in the preparation of polyisobutylene by polymerization of isobutylene in a polymerization zone in which the temperature is maintained at from 0° to −130° C., in the presence of from 0.01 to 1.0% by weight of a boron trifluoride catalyst which contains less than 0.3% by volume of foreign components, from 0.001 to 1.0% by weight of a molecular weight regulator and from 30 to 90% by weight of a low-boiling solvent which is inert under the reaction conditions, the percentages by weight in each case being based on the isobutylene employed, and, from 10 to 5000 ppm by weight of a polymerization accelerator, the solvent vaporized during the polymerization being removed continuously, liquefied and recycled in the liquid state to the polymerization zone, wherein the content of but-1-ene in the monomeric isobutylene is kept constant at from 1.9 to 2.1% by weight, base on the isobutylene and the but-1-ene contains less than 50 ppm by weight of cis-but-2-ene and trans-but-2-ene together.

4,691,073

PRODUCTION OF TERTIARY OLEFINS

Robert C. Michaelson, Kinnelon, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jul. 14, 1986, Ser. No. 885,529

Int. Cl.[4] C07C *1/20*

U.S. Cl. 585—639 **12 Claims**

1. A process for the preparation of tertiary olefins starting from the corresponding tertiary ethers, consisting in contacting said tertiary ether at a temperature of from 100° C. to 250° C. with a catalyst prepared by reacting a clay with HF and/or HCl followed by calcining, to form said tertiary olefin.

4,691,074

MONOCHLOROBIPHENYL:CUPROUS ALUMINUM TETRACHLORIDE

David G. Walker, 904 Fleetwood Dr., Baytown, Tex. 77520

Division of Ser. No. 591,128, Mar. 12, 1984, abandoned. This application Jun. 17, 1985, Ser. No. 767,321

Int. Cl.[4] C07C *7/148, 7/10, 7/156*

U.S. Cl. 585—849 **4 Claims**

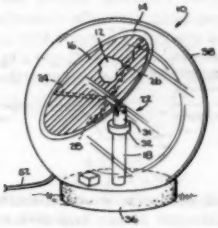
1. A process for separating a complexible ligand, selected from the group consisting of C_2 to C_5 olefins, C_2 to C_5 acetylenes, carbon monoxide and hydrogen sulfide, from a feedstream containing the ligand which consists essentially of contacting the feedstream with a liquid solution of cuprous aluminum tetrachloride ($CuAlCl_4$) in $C_{12}H_9Cl$ (an isomer or mixture of isomers of monochlorobiphenyl); said contacting being conducted under conditions to form a complex of the ligand and the solution from the feedstream while the complexed ligand is regenerated from the solvent by passing the ligand-rich solvent successively through the atmospheric reboiler (1 to 1.6 atma) pressure and one or more vacuum reboilers (0.1 to 0.9 atma pressure), whereas the gaseous streams from the reboilers are combined and cooled to yield the separated pure liquid.

4,691,075

ENERGY CONVERSION SYSTEM

Lawrence M. Murphy, Lakewood, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 16, 1985, Ser. No. 776,731
Int. Cl.[4] H02N *6/00*; H01L *25/02*
U.S. Cl. 136—246 **8 Claims**



1. Light-weight and self-contained solar energy conversion apparatus for converting solar radiation to electrical energy, comprising:

an array of photovoltaic cells mounted on a thin film substrate membrane and connected together to provide an electric power source, said thin film being stretched and mounted on a circular rim;

support means connected to said rim for supporting said array of photovoltaic cells in a position adapted to be exposed to solar radiation, said support means being adjustable about two orthogonal axes and having strength design parameters sufficient to support the array, substrate membrane, and rim safely in a still atmosphere without regard to ambient outside wind and hail loads; and

a substantially spherical dome positioned over and enclosing a chamber around said array of photovoltaic cells and support means, said dome being comprised of a specularly translucent, flexible, thin film material anchored around said support means and inflated to a pressure in the chamber in the range of about 0.02 to 0.10 pounds per square inch more than the pressure outside the chamber, the thin film material of said dome also being tear-resistant and sufficiently strong to withstand normal wind and hail storm forces and having sufficient resilience to yield without puncturing to hail stones, yet to recover to its spherical surface shape under the urging of the inflation pressure in the chamber.

4,691,076

SOLAR ARRAY WITH ALUMINUM FOIL MATRIX

Jules D. Levine, Dallas; Millard J. Jensen, Balch Springs, and Ronald E. Haney, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

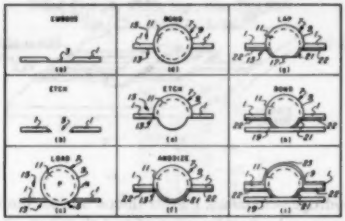
Continuation of Ser. No. 820,904, Jan. 16, 1986, abandoned, which is a continuation of Ser. No. 647,942, Sep. 4, 1984, abandoned. This application Dec. 2, 1986, Ser. No. 937,473
Int. Cl.[4] H01L *27/14*
U.S. Cl. 136—250 **12 Claims**

1. A solar array which comprises:

(a) a first aluminum foil layer having a plurality of spaced apertures therein,

(b) a plurality of discrete semiconductor members, each in a corresponding one of said apertures and having a P-type and an N-type region, the N-type region being ohmically bonded to said first aluminum foil, said bond characterized as formed by pressing said member into said corresponding aperture at a temperature in the range of from 500° to 577° C., and

(c) a contact member insulated from said first foil and coupled to the P-type region.

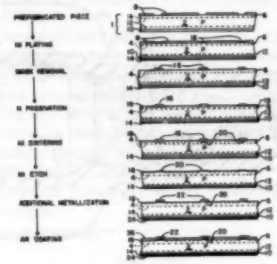


4,691,077

ANTIREFLECTION COATINGS FOR SILICON SOLAR CELLS

James A. Gregory, Sudbury; Jack I. Hanoka, and Zinovy Y. Vayman, both of Brookline, all of Mass., assignors to Mobil Solar Energy Corporation, Billerica, Mass.

Filed May 13, 1985, Ser. No. 733,712
Int. Cl.[4] H01L *31/06, 31/18*
U.S. Cl. 136—256 **14 Claims**



1. In a silicon solar cell having a grid electrode on one side thereof, the improvement comprising a surface layer of modified silicon having a refractive index of about 3.4 to 3.6 at 633 nm and about 3.6 to 3.8 at 442 nm, said surface layer being formed at said one side thereof by hydrogen ion-beam implantation in the presence of between about 2% and about 10% methane, by volume, relative to the hydrogen.

4,691,078

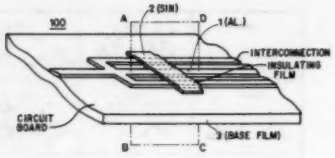
ALUMINUM CIRCUIT TO BE DISCONNECTED AND METHOD OF CUTTING THE SAME

Tadashi Nishioka; Hiroshi Koyama, both of Itami, and Yoji Mashiko, Takarazuka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 823,091
Claims priority, application Japan, Mar. 5, 1985, 60-45077
Int. Cl.[4] H05K *1/00*; B23K *26/00*
U.S. Cl. 174—68.5 **2 Claims**

1. A circuit having aluminum interconnections to be disconnected wherein said aluminum interconnections having a por-

tion to be cut are formed on an underlying insulating film base, said circuit to be disconnected comprising:



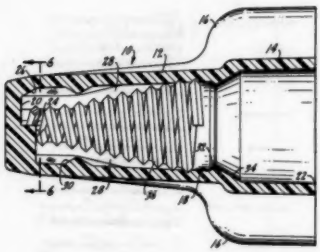
a hydrogen-containng plasma silicon nitride film formed to cover at least said portion of said aluminum interconnections to be cut.

4,691,079

SCREW-ON WIRE CONNECTOR

William E. Blaha, Elgin, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Continuation-in-part of Ser. No. 760,275, Jul. 29, 1985, abandoned. This application Dec. 3, 1986, Ser. No. 935,619
Int. Cl.[4] H01R *4/22*
U.S. Cl. 174—87 **11 Claims**



1. In an electrical connector for joining the ends of electrical wires, a cap of insulating material having a central bore open at one end and enclosed at the other end by an integral end wall, a wire coil in the bore tapered such that its maximum diameter is at the end of the coil nearest the open end of the bore, with the coil engaging the cap only at that point, and a first radial undercut on the inside of the cap, closer to the end wall than to the open end and projecting into the bore, the wire coil diameter at the undercut being less than the inside diameter of the undercut such that the coil does not engage the undercut until electrical wires are inserted into the cap to expand the coil against the undercut.

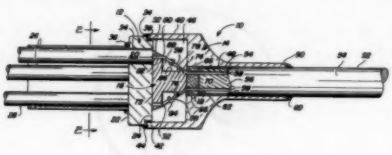
4. In an electrical connector for joining the ends of electrical wires, a cap of insulating material having a central bore open at one end and enclosed at the other end by an integral end wall, a tapered wire coil in the bore, a radial undercut on the inside of the cap, closer to the end wall than to the open end and projecting into the bore and a plurality of axial splines on the inside of the cap, extending from the end wall toward the open end of the cap, past the undercut, the splines having an outer, conical portion generally conforming to the taper of the wire coil, and an inner straight portion leading to the end wall.

4,691,080

HERMETICALLY SEALED CONNECTOR DEVICE

Charles W. Reinhart, Glendale, and Robert H. Mauldin, Flintridge, both of Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed Oct. 21, 1985, Ser. No. 789,602
Int. Cl.[4] H01R *4/02*
U.S. Cl. 174—88 R **10 Claims**



1. An improved, hermetically sealed, multiple conduit-to-single conduit connector device, said device comprising, in combination:

a. a male plug comprising a housing having a plurality of spaced, electrical conduit-receiving passageways extending longitudinally therethrough from the rear end to the front end thereof;

b. a female receptacle comprising a housing having an annular rim defining a central space within which the front end of said male plug is received and secured thereto, said female housing including a central longitudinal passageway extending therethrough, communicating with said central space and adapted to receive a single electrical conduit carrying a plurality of wires; and,

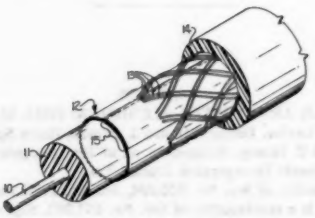
c. a dielectric wire spreader disposed between said plug front end and said longitudinal passageway in said central space, said spreader including a rear male plug-abutting portion and a front wire guide portion connected thereto and having a sloped outer surface defining spaced wire-receiving grooves adapted to guide wires from multiple electrical conduits in said male plug passageways into contact with wires from an electrical conduit in said female receptacle passageway within said central space.

4,691,081

ELECTRICAL CABLE WITH IMPROVED METALLIC SHIELDING TAPE

Chakra V. Gupta, and Brian D. Garrett, both of Conover, N.C., assignors to Comm/Scope Company, Catawba, N.C.

Filed Apr. 16, 1986, Ser. No. 852,776
Int. Cl.[4] H01B *7/34*
U.S. Cl. 174—105 R **30 Claims**



1. A cable comprising at least one metallic inner conductor, a dielectric material surrounding the at least one inner conductor, and a metallic shielding tape surrounding the dielectric material and the at least one inner conductor, said shielding tape comprising a metal foil layer and a heat sealable polymer supporting layer fusibly bonded directly to said foil layer and serving to structurally reinforce the foil layer and prevent unwanted disruptions in the foil which would adversely affect

the signal propagating properties of the cable, said polymer supporting layer comprising a polymer blend of a non-heat sealable polyolefin strength component and an elastomeric heat sealable adhesive component.

12. A metallic shielding tape useful for the preparation of shielded cable, said shielding tape comprising a metal foil layer and a heat sealable polymer supporting layer fusibly bonded directly to said foil layer and serving to structurally reinforce the foil layer and prevent unwanted disruptions in the foil which would adversely affect the signal propagating properties of the cable, said polymer supporting layer comprising a polymer blend of a non-heat sealable polyolefin strength component and an elastomer heat sealable adhesive component.

4,691,082

PLASTIC CABLE

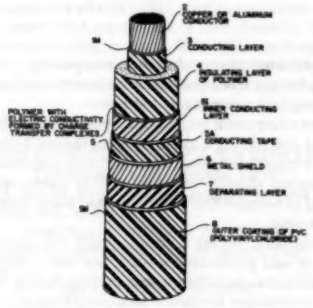
Josef Flatz, Waldmichelbach; Gert Weddigen, Heidelberg; Hans-Joachim Böhme, Ketzsch; Fritz Grieser, Weinheim; Robert Huber, Ketsch, and Hans Nienburg, Mainz, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Mar. 13, 1986, Ser. No. 839,070

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509168

Int. Cl.[4] H01B *9/02*

U.S. Cl. 174—106 SC **19 Claims**



1. Plastic cable comprising at least one electric conductor surrounded by a cable covering comprising an insulating layer and a plurality of electrically conducting layers of a polymeric material which include an inner conducting layer and an outer conducting layer, with at least the outer conducting layer made of a synthetic polymer of triaromatic methane units, said synthetic polymer formed by polycondensation of an aromatic aldehyde and an aromatic ring compound which has at least one functional group which increases the electric density in the aromatic ring compound and thereby promotes the electrophilic action; by polycondensation of bisphenol-A and 4-dimethylaminobenzaldehyde; by polycondensation of bisphenol-A and para-anisaldehyde; and by a catalytic reaction in which methanes substituted by double-or triple aromatics are brought to reaction, said polymer having at least the properties,

(1) meltable-transformation from a solid into a liquid by means of heat, and

(2) soluble-capable of mixing with a liquid to dissolve to form a solution, the electric conductivity of the layers of polymer with triaromatic methane units is adjusted to at least 10^{-5} ohm^{-1} cm^{-1} by a content of charge transfer complexes, and the outer conducting layer is composed of an extruded layer of the conductive meltable polymer with triaromatic units and of a wrapping disposed thereon of carbon-black-containing paper or woven tape.

4,691,083

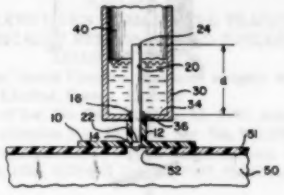
VENTING APPARATUS FOR ELECTRICAL CABLE

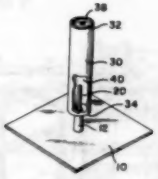
Zoltan B. Dienes, Annandale, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Oct. 4, 1985, Ser. No. 783,988

Int. Cl.[4] H02G *15/00*

U.S. Cl. 174—135 **7 Claims**





1. An apparatus for preventing rainwater from entering an air vent opening in an electrical cable jacket, said apparatus comprising;

a support pad for disposition over an opening in an electrical cable jacket;

venting means on said pad alignable with said opening;

an elongate hollow tube supported in communication with said venting means and extending from said support pad;

an elongate housing supported by said venting means and enclosing said hollow tube, said housing and said hollow tube extending partially coextensively and forming a holding chamber therebetween for holding a given volume of rainwater; and

outlet means on said housing for permitting air passage therethrough.

4,691,084

COMBINED ENERGISER AND REEL FOR ELECTRIC FENCES

Anthony C. Standing, 6 Buckland Pl., Cambridge, New Zealand

Continuation of Ser. No. 639,355, Aug. 9, 1984, abandoned. This application Sep. 9, 1986, Ser. No. 905,680

Int. Cl.[4] A01K *3/00;* **H05C** *1/00*

U.S. Cl. 191—12.2 R **6 Claims**

1. An electric fencing device of the type including a hub for the storage of fence wire, support means in which the hub is rotatably supported, an electric fence energizer and a power source located within said hub for supplying electric current to said fence wire, and a grounding member for connecting the energizer to ground, the improvement comprising:

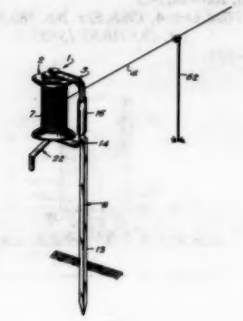
said hub being formed from an electrical insulating material;

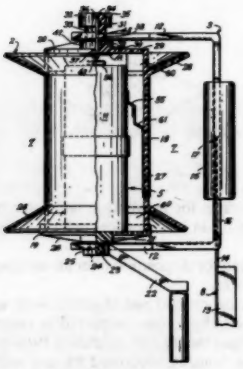
said support means being formed from an electrically conductive material and having spaced arms between which said hub is journalled for rotation, one axial end of said hub being rotatably supported in one of said arms; and,

a contact member carried by and in electrical continuity with the other of said arms, said contact member extending axially through the opposite axial end of said hub and supporting said opposite end for rotation relative to the other said arm;

said contact member extending axially into direct contact

with a grounding contact of said energizer and providing a pivotal contact between said electrically conductive





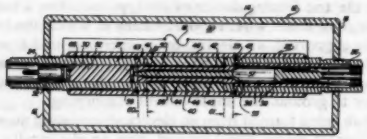
support means and said grounding member of said energizer.

4,691,085

HIGH VOLTAGE INTERRUPTING SWITCH WITH IMPROVED CONTACT CONNECTION ARRANGEMENT AND METHOD

Roy T. Swanson, N. Riverside, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Dec. 19, 1985, Ser. No. 810,792
Int. Cl.[4] H01H *33/06*
U.S. Cl. 200—151 **25 Claims**



1. An improved arrangement for electrically interconnecting the separable, electrical contacts of a device in which portions of a first contact and a second contact are engaged, the device being operated in response to movement of a drive element to rapidly separate the contacts via movement of one or both contacts, wherein the improvement comprises:

a member; and

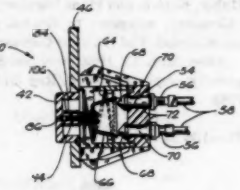
means provided on the second contact and cooperating with said member for providing a contact-engagement force between the first and second contacts resulting from the insertion of at least a portion of said member or the second contact in the other and for providing the release of the contact-engagement force between the first and second contacts by relative movement between said member and the second contact in response to the movement of the drive element during device operation and in response to contact of said member by the drive element.

4,691,086

PUSHBUTTON ELECTRICAL SWITCH HAVING A FLAIRING CONTACTOR LOOSELY ROTATABLE ON A SPRING-BIASED EYELET

John W. Habecker, Zion, and Charles E. Black, III, Mount Prospect, both of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Filed Apr. 3, 1986, Ser. No. 847,498
Int. Cl.[4] H01H *1/18, 1/32, 13/14*
U.S. Cl. 200—159 R **4 Claims**



1. A pushbutton electrical switch, comprising

a casing having front and rear components with means for securing said components togther,

said front component including a hollow casing sleeve with a front end having a guide opening therein extending out of said casing and away from said rear component,

a pushbutton slidably received in said guide opening for sliding movement therein toward and away from said rear component,

said pushbutton having a front portion for manual movement of said pushbutton toward said rear component,

said pushbutton including a rear portion having an electrically conductive contactor mounted thereon,

said rear portion of said pushbutton including an axial generally cylindrical pin structure projecting in said casing toward said rear component for supporting said contactor,

said contactor being generally cup-shaped with a front end wall and a hollow annular side wall projecting from said end wall toward said rear component,

said annular side wall having an interior annular surface flaring away from said end wall,

said end wall of said contactor having an axial substantially circular aperture therein,

an eyelet loosely and rotatably received in said aperture,

said eyelet having a tubular substantially cylindrical shank portion loosely and rotatably received in said aperture,

said eyelet having a front end flange projecting generally radially outwardly from said shank portion in front of said end wall for loosely rotatable engagement therewith,

said eyelet having a rear end flange projecting generally radially outwardly from said shank portion to the rear of said end wall for loose rotatable engagement therewith,

said shank portion of said eyelet having a substantially circular and tubular opening therein loosely received around said pin structure with a loosely slidable and rotatable fit therebetween,

said pin structure having means forming a rear retaining element projecting generally radially outwardly thereon for abutting engagement by said rear end flange of said eyelet,

a compression coil spring received around said pin structure in front of said eyelet and compressed between said rear portion of said pushbutton and said front end flange of said eyelet for biasing said eyelet toward and against said rear retaining element,

said rear retaining element being free and clear of said contactor,

said coil spring being free and clear of said contactor whereby said contactor has free unimpeded rotatability relative to said eyelet,

said rear component of said casing comprising a terminal head including an electrically insulating member having a front portion facing toward said contactor but spaced therefrom,

said terminal head having a plurality of electrically conductive contact points mounted on said front portion of said electrically insulating member and projecting therefrom toward said interior annular surface of said contactor,

said terminal head having exterior electrically conductive terminals connected to said contact points,

and a second compression coil spring disposed in said casing and spaced away from said contactor for biasing said pushbutton away from said terminal head,

said pushbutton being manually movable toward said terminal head against the biasing action of said second coil spring to bring said interior annular surface of said contactor into wiping engagement with said contact points for connecting them together electrically,

said contactor being self-aligning with said contact points due to the free unimpeded rotatability of said contactor relative to said eyelet and also due to the loose slidability and rotatability of said eyelet relative to said pin structure,

the free unimpeded rotatability of said contactor relative to said eyelet tending to cause distribution and equalization of wear on said contactor due to repeated engagement between said contactor and said contact points.

4,691,087

PREVENTING TWIST OF A MICROWAVE TEMPERATURE PROBE LINE

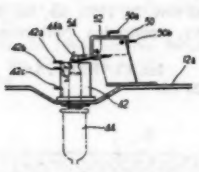
Hee J. Lee, Masan, Rep. of Korea, assignor to Gold Start Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 3, 1986, Ser. No. 925,961

Claims priority, application Rep. of Korea, Nov. 29, 1985, 15825/1985

Int. Cl.[4] H05B *6/68, 6/80*

U.S. Cl. 219—10.55 B **1 Claim**



1. Means for preventing twist of a connecting line for a temperature probe in a microwave range comprising,

a disk provided with a protrusion at its peripheral surface and rotatably mounted on a rotating axis of a synchronous motor,

an activating lever pivotally fixed on supporting plates formed on a fixing plate by an axial pin and having a stopping pin at its one end adapted to contact said protrusion of said disk and at the other end a steel piece,

an electromagnet to attracting said steel piece of said activating lever on its operation,

a torsion spring with its body portion being inserted onto said axial pin to urge said activating lever toward a stopping member formed on said fixing plate, and

a micro switch to activate said electromagnet by means of an actuating protrusion contacted and pushed by an actuating means which is thrusted according to a connecting rod being inserted into a jack.

4,691,088

MICROWAVE OVEN WITH POWER TRANSFER AUTOMATICALLY RESPONSIVE TO DIELECTRIC LOAD OF FOOD

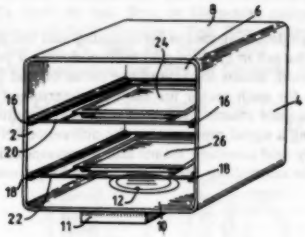
Kenneth I. Eke, South Croydon, England, assignor to Microwave Ovens Limited, Surrey, England

Continuation of Ser. No. 765,211, Aug. 13, 1985, abandoned. This application Sep. 22, 1986, Ser. No. 910,328

Claims priority, application United Kingdom, Aug. 14, 1984, 8420608; Jan. 3, 1985, 8500095; Feb. 23, 1985, 8504724; May 29, 1985, 8513536

Int. Cl.[4] H05B *6/74*

U.S. Cl. 219—10.55 F **12 Claims**



1. A microwave oven comprising: a cavity; a magnetron coupled to said cavity for producing microwave power in said cavity; said cavity being defined by cavity walls, means for launching said microwave power into said cavity, means for distributing said microwave power directly into said cavity; said cavity, said distributing means and said launching means being constructed and arranged so that said cavity is a multimode cavity with a large number of electric field resonances; and a metal tray supported in said cavity a predetermined distance above said launching means with the peripheral edges of said tray spaced further predetermined distances from said cavity walls so that the oven when devoid of food is ineffective in terms of effectiveness of power transfer from said magnetron to said cavity including said tray, and the effectiveness of power coupled and transferred to the loaded oven from said magnetron increases as a function of the dielectric load of food items placed on said tray in said cavity whereby the effectiveness of said power transfer is automatically accommodated to said food load in response thereto.

4,691,089

TRAVELLING WIRE EDM APPARATUS WITH MONITORING OF THE NUMBER OF ELECTRICAL DISCHARGES OCCURRING IN A SECTOR OF THE ACTIVE PORTION OF THE ELECTRODE WIRE

Francois Balleys, Petit-Lancy, Switzerland, assignor to Charmilles Technologies S.A., Geneva, Switzerland

Filed Oct. 16, 1985, Ser. No. 787,985

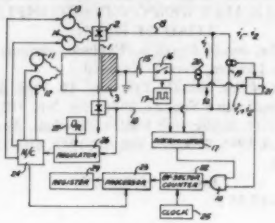
Claims priority, application Switzerland, Oct. 16, 1984, 4952/84

Int. Cl.[4] B23H *7/04, 1/02*

U.S. Cl. 219—69 W **5 Claims**

4. An apparatus for controlling the shape of a surface of an electrically conductive workpiece cut by machining electrical discharges by means of an electrode wire stretched and displaced longitudinally between a pair of electrode wire guides,

the electrode wire having an active portion disposed in a machining zone formed between the electrode wire and the surface cut in the workpiece, said apparatus comprising means for arbitrarily deviding the active portion of the electrode wire into a plurality of sectors, means for detecting a sector among the plurality of sectors along the active portion of the electrode wire where an electrical discharge occurs, means for detecting machining electrical discharges, counting means associated with each of said sectors and with said machining electrical



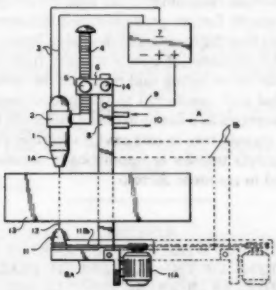
discharge detecting means for counting said machining electrical discharges in each of said sectors during a predetermined time period, means for saving the count of said electrical discharges for each sector for each predetermined time period, and processor means associated with said counting means for providing a signal representing the difference between the the count by said counting means and a corresponding reference value for controlling the electrical discharge machining process.

4,691,090

METHOD AND DEVICE FOR PLASMA CUTTING OF NON-METALLIC MATERIALS

Dimo T. Garlanov; Dimieter A. Dimitrov; Marin H. Beleov; Vladimir P. Hibearov; Ivan V. Vangelov, all of Sofia; Nikolay Y. Nikov, Varna, and Ivan S. Savov, Sofia, all of Bulgaria, assignors to NPK za Kontrolno Zavarachni Raboti, Sofia, Bulgaria

Filed Dec. 9, 1980, Ser. No. 214,796
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 PC **4 Claims**



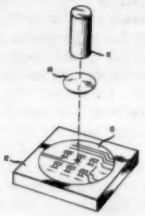
1. A method for cutting non-metallic material by means of a plasma are adapted to be formed between a plasma torch and a non-melting electrode-anode, comprising the steps of forcibly elongating the plasma arc by increasing the distance between said plasma torch and said non-melting electrode-anode to a predetermined extent so as to permit the passage of said non-metallic material therebetween to thereby place said non-metallic material under the direct action of said plasma arc; and thereafter cutting said non-metallic material by means of said plasma arc; rotating said non-melting electrode-anode prior and/or during cutting said non-metallic material to increase the life-span of said non-melting electrode-anode.

4,691,091

DIRECT WRITING OF CONDUCTIVE PATTERNS

Alan M. Lyons, Summit, N.J.; Frederick T. Mendenhall, Jr., Carmel, Ind.; Murray Robbins, Berkeley Heights, N.J.; Nathaniel R. Quick, Randolph, N.J., and Cletus W. Wilkins, Jr., Westfield, N.J., assignors to AT&T Technologies, Berkeley Heights and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Filed Dec. 31, 1985, Ser. No. 814,986
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LM **10 Claims**



1. A method for making a conductive pattern on a substrate of which at least a surface portion consists essentially of a polymeric material,

said method comprising a step of directing a laser beam onto said surface portion and causing relative motion between said beam and said substrate so as to delineate said pattern on said surface portion,

said motion being controlled so as to cause thermal decomposition of selected portions of said material,

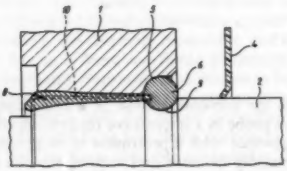
whereby said selected portions are transformed into an electrically conductive carbon material such that rsistance of conductive paths in said pattern is less than 16 ohms/cm.

4,691,092

METHOD FOR WELDING TWO PARTS TOGETHER EMPLOYING A CONCENTRATED ENERGY BEAM AND PROTECTIVE MEMBER

Martin B. Verburgh, Amersfoort, Netherlands, and Dieter Pfeifle, Filderstadt, Fed. Rep. of Germany, assignors to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed Nov. 27, 1985, Ser. No. 803,201
Claims priority, application Netherlands, Dec. 7, 1984, 8403735
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LD **5 Claims**



1. In the method for welding together first and second parts separated by a gap of extended depth, said gap being open at both ends in the direction of the gap's depth, wherein a concentrated beam of energy in the direction of the gap's depth causing melting of the parts is directed into the gap between the first and second parts, the improvement comprising perma-

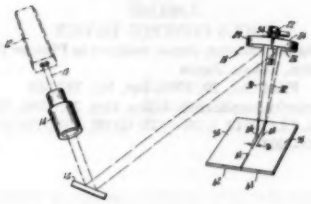
nently attaching to at least one said part a protective member at the end of the gap away from the end thereof where the beam first strikes the parts for preventing passage of the beam of energy beyond the gap, the load bearing capability of the formed weld between said parts being unaffected by the presence of said protective member.

4,691,093

TWIN SPOT LASER WELDING

Conrad M. Banas, Bolton, and Brian M. Doyle, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 22, 1986, Ser. No. 854,633
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LC **6 Claims**



1. Multiple spot laser welding apparatus responsive to an external signal for laser welding of workpieces each having a surface, and each abutting at a weld seam, comprising:

a one-piece mirror receiving a laser beam at a single reflective surface thereof and including a plurality of mirror sections having respective portions of said single reflective surface for reflecting a plurality of focused sub-beams, and at least one bendable hinge portion integral with and pivotably interconnecting said mirror sections; and

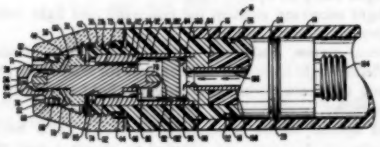
deformation means adapted to receive said mirror sections and pivoting the same about said hinge portion for adjustably positioning said sub-beam plurality on workpiece surfaces at the weld seam forming respective spots thereon.

4,691,094

PLASMA-ARC TORCH WITH SLIDING GAS VALVE INTERLOCK

Bruce O. Hatch, Lebanon, and Richard A. Spaulding, Hanover, both of N.H., assignors to Thermal Dynamics Corporation, West Lebanon, N.H.

Filed May 20, 1986, Ser. No. 865,256
Int. Cl.[4] B23K *15/00*
U.S. Cl. 219—121 PR **10 Claims**



1. A plasma-arc torch comprising:

a torch housing,

an inlet and an outlet in said housing,

passage means in said housing for conducting fluid from said inlet to said outlet,

an electrode in said housing adapted to be in an operational position adjacent said outlet for generating an arc,

a closure comprising retaining means removably connected to said housing for retaining said electrode in said housing,

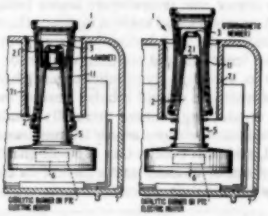
valve means in said housing operable to interrupt fluid flow from said inlet to said outlet when said retaining means is disconnected and removed from said housing, wherein said passage means includes a means defining a valve chamber therein and wherein said valve means comprises a valve element which is slidably movable within said valve chamber without the influence of any spring biasing means but only under the influence of fluid directed from said inlet to said outlet to selectively close or open fluid communication from said inlet to said outlet by way of said chamber.

4,691,095

HAIR ROLLER HEATING DEVICE WITH THERMOMAGNETIC ROLLER TEMPERATURE CONTROL

Karlheinz Barowski, Hattersheim, and Conrad Berghammer, Kronberg/Ts, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Aug. 21, 1985, Ser. No. 768,033
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1984, 3434072
Int. Cl.[4] A45D *2/12, 4/12;* H05B *1/02, 3/00*
U.S. Cl. 219—222 **13 Claims**



1. A hair styling device composed of a hair roller and heatable spindle structure for heating said hair roller,

said hair roller comprising a jacket containing a heat storing material and structure forming a heat exchange surface for supplying heat to the heat storing material and defining a conical inner chamber open at its larger end,

said heatable spindle structure adapted to be inserted into mating heat exchange engagement with said inner chamber of said roller and having structure defining a conical outer surface matching the surface of the conical inner chamber of said hair roller, biasing means associated with one of said roller and spindle structure for lifting said hair roller out of heating engagement with said heatable spindle structure,

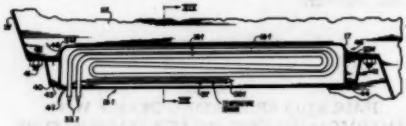
and holding means for stressing said biasing means when said hair roller is placed on said heatable spindle and preventing said hair roller from being lifted out of engagement with said heatable spindle structure by the action of said stressed biasing means, said holding means comprising a body of ferromagnetic material disposed on said hair roller and a magnet, said body of ferromagnetic material being moved into the holding range of said magnet in response to said hair roller being placed on said heatable spindle structure to hold said biasing means in its stressed condition, the Curie temperature of said body of ferromagnetic material corresponding to the set temperature of said hair roller so as to release said biasing means at said temperature, and means for heating said heatable spindle structure.

4,691,096

ELECTRICALLY HEATED DEEP FAT FRYER

Hermann Knauss, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany

Division of Ser. No. 640,564, Aug. 14, 1984, Pat. No. 4,574,183.
This application Dec. 11, 1985, Ser. No. 807,827
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1983, 3329793
Int. Cl.[4] F27D *11/02*; H05B *3/68*
U.S. Cl. 219—441 27 Claims



1. An electric heating device for heating a substance, comprising:

a wall to be heated, the wall at least partially defining an area for the substance, the substance being disposed against a first surface of the wall for heating;

tubular heating means including a metallic tube with electrical insulation and heating resistors therein, the tubular heating means being soldered to a second surface of said wall;

a temperature control means having an elongated temperature sensor, said temperature sensor being mounted at said wall on said second surface in direct thermally-conductive contact with said second surface over substantially an entire length of said temperature sensor and closely adjacent to, substantially parallel to, and thermally responsive to at least one of said tubular heating means; and,

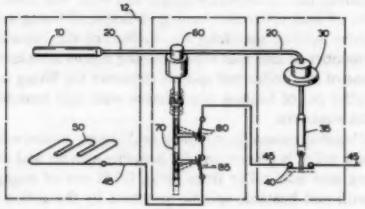
a heat conducting element thermally conductively connecting said temperature sensor to said second surface of said wall, said heat conducting element enclosing said temperature sensor over at least a part of its circumference, and over substantially its entire length.

4,691,097

FAIL SAFE SAFETY CONTROL DEVICE

John J. Theiss, St. Louis, Mo., and Paul T. Durst, Louisville, Ky., assignors to Temp. Systems, Inc., St. Louis, Mo.

Filed Jun. 23, 1986, Ser. No. 877,260
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—513 17 Claims



1. In a temperature control system consisting of a nonelastic container adapted to be subject to temperature changes, a capillary tube connected to said container and extending to a first pressure responsive device, a thermally expansible and contractable material filling said container, said tube, and said first pressure responsive device, and a linkage connecting said first pressure responsive device to a first control device whereby changes in the first pressure responsive device, resulting from expansion or contraction of the expansible/contractable material caused by changes in the temperature of the area surrounding said nonelastic container, open or close the first control device so as to regulate when a primary heating device is supplying heat, the improvement wherein a second pressure responsive mechanism is interconnected with the material-filled capillary tubing in such a fashion that changes in the second pressure responsive device, resulting from expansion or contraction of the expansible/contractable material caused by the temperature of the area surrounding said nonelastic container having reached a preselected upper safety limit value, will activate a second control device so as to prevent the primary heating device from supplying heat; which second pressure responsive device will also activate a third control device to prevent the primary heating device from supplying heat when the expansible/contractable material does not completely fill the bulb, capillary tube, first pressure responsive device, and second pressure responsive device.

4,691,098

FOCUS CONTROL DEVICE

Takanori Maeda, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 29, 1985, Ser. No. 792,560
Claims priority, application Japan, Oct. 29, 1984, 59-227441
Int. Cl.[4] G01J *1/20, 1/24*; G11B *7/00, 20/22*
U.S. Cl. 250—201 8 Claims

1. A focus control device comprising:

a light source;

a movable recording medium on which incident light from said light source is focused and reflected therefrom;

an objective lens, positioned in the optical path of said incident light between said light source and said recording medium, for focusing incident light from said light source on said recording medium;

a beam splitter, positioned in the optical paths of said incident light from said light source and said reflected light from said recording medium, for separating said reflected light from said incident light and reflecting said separated light along an optical path;

a light receiving element for receiving said light reflected from said beam splitter;

optical means, positioned in said optical path of said reflected light from said beam splitter for selectively absorbing and transmitting said reflected light from said beam splitter;

said optical means comprising absorbing parts having a selected thickness and adapted to absorb a part of said reflected light from said beam splitter, and transmitting parts adapted to transmit a part of said reflected light from said beam splitter, said absorbing parts forming a predetermined angle with respect to the optical axis of said optical path of said reflected light from said beam splitter such that upon movement of said recording medium relative to said objective lens, varying amounts of reflected light from said beam splitter, indicative of the relative positions

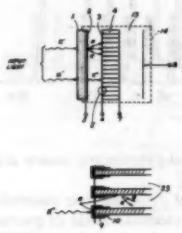
of said objective lens and said recording medium, impinge on said light receiving element.

4,691,099

SECONDARY CATHODE MICROCHANNEL PLATE TUBE

C. B. Johnson, Fort Wayne, Ind., assignor to ITT Electro Optical Products, Roanoke, Va.

Filed Aug. 29, 1985, Ser. No. 770,446
Int. Cl.[4] H01J *31/50*
U.S. Cl. 250—213 VT **9 Claims**



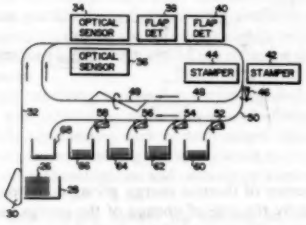
1. A radiant energy microchannel plate tube comprising:
a tube envelope;
a tube input window mounted in said envelope;
a first photocathode mounted on said input window;
a microchannel plate array mounted within said tube envelope and spaced from said tube input window with its input facing said input window; and
a second photocathode mounted on said microchannel plate input and spaced from said tube input window.

4,691,100

SHEET ORIENTER USING FLAP DETECTION

Shuji Kizu; Tsuyoshi Ishida, both of Yokohama, and Yasuo Nagase, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 11, 1984, Ser. No. 629,964
Claims priority, application Japan, Jul. 13, 1983, 58-127282
Int. Cl.[4] G01N *9/04*; G06M *7/00*
U.S. Cl. 250—223 R **8 Claims**



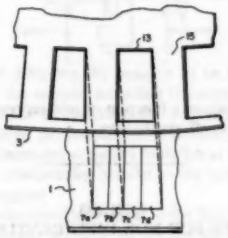
1. An apparatus for detecting the direction of a paper sheet having a first surface with a flap and a second surface comprising:
means for transporting said paper sheet;
means for radiating a parallel light beam on one surface of said paper sheet being transported from an oblique direction with respect to the surface of the paper sheet, said parallel light beam crossing the direction of the outline of said flap;
means for receiving said light beam reflected from said one surface of said paper sheet to detect a shadow which is caused by said flap being obliquely radiated from said parallel light beam;
means for determining whether said second surface is facing said receiving means when said receiving means does not detect said shadow or said first surface is facing said receiving means when said receiving means does detect a shadow; and
means for reversing said first and second surfaces of said paper sheet when said judging means judges that said second surface is facing said receiving means, said reversing means carrying said paper sheet back to said transporting means after said reversing.

4,691,101

OPTICAL POSITIONAL ENCODER COMPRISING IMMEDIATELY ADJACENT DETECTORS

Mark G. Leonard, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 19, 1985, Ser. No. 747,084
Int. Cl.[4] G01D *5/38*
U.S. Cl. 250—231 SE **47 Claims**



20. An optical encoder for indicating the rotational movement of a shaft, comprising:
an emitter means for emitting a light beam along a light path;
a light modulation means concentrically attached to the shaft and placed in the light path for modulating the light beam in response to the rotation of the shaft; and
a detector means, positioned in the light path, for receiving the modulated light beam with individual light detectors located immediately adjacent to one another and for generating index signals that reach their extreme amplitude at least once during each revolution of the shaft.

4,691,102

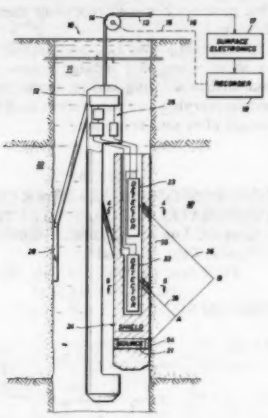
BOREHOLE COMPENSATION METHOD AND APPARATUS USING VARIATIONS IN RELATIVE BOREHOLE COMPONENTS

Ward E. Schultz, and Harry D. Smith, Jr., both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 17, 1985, Ser. No. 745,723
Int. Cl.[4] G01V *5/00*
U.S. Cl. 250—256 **7 Claims**

1. For use in logging downhole earth formations penetrated by a borehole, a method for compensating measured gamma radiation for borehole effects on the photoelectric component thereof, comprising:
(a) measuring, with a first detector within the borehole, relatively low energy gamma radiation in the photoelectric effect energy range entering the borehole along a first predetermined path, and generating a first signal representative of the gamma radiation so measured,
(b) measuring, with a second detector within the borehole, relatively low energy gamma radiation in the photoelectric effect energy range entering the borehole along a second predetermined path different from the first path, and generating a second signal representative of the gamma radiation so measured,

(c) selecting said predetermined first and second paths such that differences in relative formation components of said first and second signals are minimized, and relative borehole components thereof are varied, and



(d) determining, as a function of said representative signals, the borehole effects thereon.

4,691,103

MICROSCOPE FOR NON-DIFFERENTIATED PHASE IMAGE FORMATION

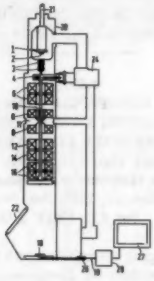
Jan B. Le Poole, Tucson, Ariz., and Nicolaas H. Dekkers, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 23, 1985, Ser. No. 757,998

Claims priority, application Netherlands, Jul. 25, 1984, 8402340

Int. Cl.[4] H01J *37/28*

U.S. Cl. 250—311 **15 Claims**



1. A microscope comprising a radiation source, a lens system, a beam scanning system, a radiation detector divided into a plurality of separately readable elements, a detector read-out system, and a monitor system receiving signals from said detector read-out system;

wherein the improvement comprises said beam scanning system including means for forming a scanning pattern provided in a continuous pattern of connected line segments, said radiation detector detecting separate signals for each line segment of said scanning pattern to be recorded.

4,691,104

ONE-DIMENSIONAL PYROELECTRIC SENSOR ARRAY

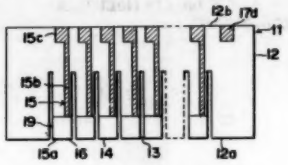
Michihiro Murata; Katsuhiko Tanaka, and Hiroyuki Seto, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 12, 1985, Ser. No. 743,950

Claims priority, application Japan, Jun. 14, 1984, 59-123423

Int. Cl.[4] G01J *5/10*

U.S. Cl. 250—338 **16 Claims**



1. A one-dimensional pyroelectric sensor array which comprises:

a base plate made of a pyroelectric material;

a plurality of strip elements made of pyroelectric material and having a free end and another end, said strip elements each having a heat-sensitive region at said free end thereof, and each being supported only at the other end to the base plate to form an integrated structure with the base plate, each of said strip elements being separated from each adjacent strip element at portions thereof away from said base plate; and

at least one pair of detecting electrodes formed on the heat-sensitive region of the free end of each strip element.

4,691,105

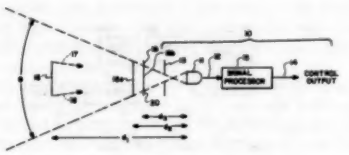
THERMAL ENERGY PROXIMITY DETECTOR

Norman P. Huffnagle, Hennepin, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 3, 1985, Ser. No. 740,798

Int. Cl.[4] G01J *1/28*

U.S. Cl. 250—338 **2 Claims**



1. A detector of thermal energy giving an output which is determined by the rate of change of the energy received by said detector, and which is independent of the absolute value of that energy comprising:

means establishing a field of view for said detector such that as the distance between said detector and a source of thermal energy decreases, the source occupies an increasingly large portion of the field, and the energization of said detector increases until the source fills the entire field of view, whereupon the energization of said detector has no further effective rate of change, so that the output of the detector becomes zero;

and output means connected to the detector for giving a signal when the detector output becomes zero.

4,691,106
APPARATUS FOR DETERMINING REFLECTIVITY OF AN OBJECT SUCH AS A MIRROR

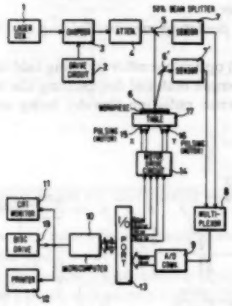
Choi J. Hyun; Lee J. Chul, both of Seoul, and Choi W. Bum, Kyungki-Do, all of Rep. of Korea, assignors to Daewoo Heavy Industries Ltd., Incheon, Rep. of Korea

Filed Sep. 13, 1985, Ser. No. 775,749

Claims priority, application Rep. of Korea, Nov. 20, 1984, 84-7249

Int. Cl.[4] G01N *21/55*

U.S. Cl. 250—349 1 Claim



1. An apparatus for detecting defects in a laser mirror to be inspected, comprising:

an infrared laser beam generator;

a chopper receiving the output beam from said generator and modulating it to have a selected frequency;

an attenuator receiving the modulated output beam from said chopper and attentuating it to a selected intensity level;

a beam splitter adapted to split the output beam from said attenuator, a portion thereof being irradiated on and reflected from the laser mirror to be inspected;

a pair of infrared ray-sensors, one of which receives said portion of the output beam reflected from the laser mirror and the other of which receives directly the remaining portion of the output beam from said beam splitter, such remaining portion thereof constituting a reference beam, such sensors producing analog output signals respectively corresponding to the intensities of the reflected and reference beams;

a multiplexer receiving both analog output signals from said sensors and combining them into a multiplexed signal alternately representing each of such output signal;

An A/D converter receiving the multiplexed analog output signal from said multiplexer and converting it into a digital signal;

X- and Y-axes pulsing motors for moving an X-Y table supporting the laser mirror to be inspected thereon;

a circuit for driving said X- and Y-axes pulsing motors;

an I/O port receiving the digital signal from said A/D converter and supplying it to a micro-computer; and

said micro-computer receiving the digital signal from said I/O port and deriving therefrom a comparison of the relative intensities of said reference beam and said reflected beam, said micro-computer further actuating said driving circuit for said pulsing motors so as to cause said X-Y table to move so that the laser mirror thereon is continuously scanned by the portion of the laser output beam irradiated thereon.

4,691,107
INFRA RED PHOTO DETECTOR SYSTEMS

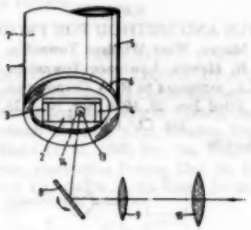
Charles T. Elliott, and Anthony M. White, both of Malvern, England, assignors to The Secretary of State for Defence, London, England

Division of Ser. No. 485,888, Apr. 18, 1983, Pat. No. 4,572,953. This application Oct. 4, 1985, Ser. No. 784,469

Claims priority, application United Kingdom, Apr. 19, 1982, 8211291

Int. Cl.[4] H01L *31/00*

U.S. Cl. 250—370 15 Claims



1. A method of detecting the position of an infrared light source in a scene, the method including the steps of:

imaging the scene on to a photosensitive surface region of an infrared sensitive photoconductive element, the element having bias electrodes arranged to define at least one bias current path substantially parallel to the said photosensitive surface region;

applying a DC electrical bias signal to the bias electrodes to generate an output signal from the photoconductive element;

controlling the element output signal by reversing the bias polarity;

detecting the controlled element output signal; and

extracting the light source image position from a difference/sum ratio of element resistance for the two bias polarities.

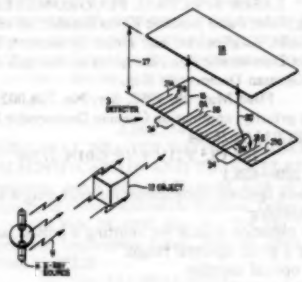
4,691,108
IONIZATION DETECTOR

Douglas S. Steele, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 565,672, Dec. 27, 1983. This application Feb. 27, 1986, Ser. No. 834,262

Int. Cl.[4] H01J *47/18*

U.S. Cl. 250—385 6 Claims



1. An ionization detector, comprising:

a substrate;

a plurality of data detectors positioned on the substrate so as

to respond to x-radiation attenuated by passing through an object;

a plurality of reference detectors positioned on the substrate so as to respond to x-radiation which does not pass through the object; and

a conductor located between the data detectors and the reference detectors which is coupled with a means for preventing electron accumulation on the conductor;

whereby the perpendicularity of electric field lines on nearby detectors is enhanced and arcing between the space and the nearby detectors is reduced.

4,691,109

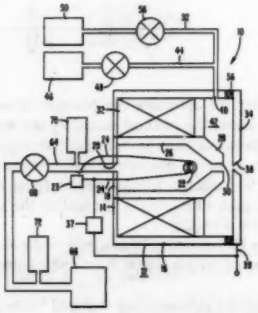
APPARATUS AND METHOD FOR PRODUCING IONS

Charles W. Magee, West Windsor Township, Mercer County, and Lori R. Hewitt, Lawrence Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 28, 1986, Ser. No. 823,258

Int. Cl.[4] H01J *27/00*

U.S. Cl. 250—426 **8 Claims**



1. In an ion beam source which includes within a housing a filament cathode, a means for providing a magnetic filed within said housing, an anode spaced from the cathode and having an opening therethrough, and means for admitting pure helium gas to be ionized into the housing between the anode and the cathode, a means for creating an arc discharge the improvement comprising

an outlet opening through the housing on the side of the cathode away from the anode, means for causing a flow of the helium gas over the cathode and out of the housing through said opening and means for providing a flow of a starting gas over the cathode.

4,691,110

LASER SPECTRAL FLUOROMETER

Wolfgang Nebe; Jutta Reichel; Klaus Biehler, all of Jena; Hartmut Lucht, Altglienicke, and Heinz Drommert, Berlin, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Mar. 25, 1985, Ser. No. 716,002

Claims priority, application German Democratic Rep., May 2, 1984, WPG01J/2625764

Int. Cl.[4] F21V *9/16*; G01N *21/64*

U.S. Cl. 250—458.1 **7 Claims**

1. A laser spectral fluorometer for analyzing a sample material, comprising

a laser radiation source for emitting a pulsed laser radiation over a given spectral range,

a first optical member,

at least a first slit,

a second optical member having an object side focus,

said first optical member producing a narrow diameter portion of said laser radiation in said first slit,

said first slit being variable within two end positions, the one end position being fully open, the other end position being closed,

said first slit being arranged in said object side focus of said second optical member,

means for varying said first slit,

said second optical member imaging said laser radiation at infinity,

at least a first deviating member, a third optical member, and a sample material to be analyzed,

a displaceable base,

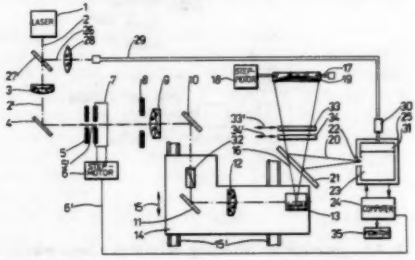
said first deviating member, said third optical member, and said sample material being commonly mounted on said base subsequently in said laser radiation,

said first deviating member directing said laser radiation from said second optical member to said third optical member,

said first deviating member folding said laser radiation by 90°,

said third optical member focusing said laser radiation into said sample material for exciting the latter,

a luminescence radiation thereby being emitted by the excited sample material substantially at right angles to said laser radiation, impinging upon said sample material, and substantially in parallel to at least a portion of said laser radiation before said first deviating member,



an emission monochromator, in turn, comprising a concave reflective grating rotatably seated about a substantially horizontal axis,

said concave reflective grating having an image side focus, and being arranged in opposition to said sample material in said luminescence radiation,

said concave reflective grating dispersing said luminescence radiation into a dispersed wavelengths radiation,

a reflector,

an evaluation unit having an entry slit,

said reflector directing said dispersed wavelengths radiation into said entry slit,

said image side focus being located in said entry slit,

means for displacing said base in a plane defined by said laser radiation and said luminescence radiation, substantially along the latter,

said means for displacing said base adjusting said image side focus in said entry slit.

4,691,111

MULTIPLE GAP OPTICALLY ACTIVATED SWITCH

Lawrence J. Bovino, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 596,966, Apr. 5, 1984, Pat. No. 4,633,286. This application Sep. 3, 1986, Ser. No. 903,808

Int. Cl.[4] G02B *27/00*

U.S. Cl. 250—551 **2 Claims**

1. A high voltage pulse forming network comprising:

a pair of similar optically activated switches;

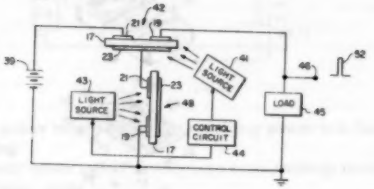
each switch comprising a bulk semiconductor wafer, a pair of spaced electrical contacts arranged in a line on one of

the broad surfaces of said wafer, and a bridging electrode located on the opposite broad surface of said wafer overlapping and bridging the pair of spaced contacts;

a source of high voltage connected to an electrical contact of a first optically activated switch;

an output terminal connected to the other contact of said first switch;

the other optically activated switch having an electrical contact connected to the bridging electrode of said first switch, with the other contact of the same connected to ground;



first light source means for illuminating and activating said first switch;

second light source means for illuminating and activating the other switch; and

control means for sequentially enabling said first and second light source means, said second light source means being enabled a predetermined short time after the first light source means is enabled to thereby disable the first optically activated switch.

4,691,112

APPARATUS FOR THE DETECTION OF OPTICAL MARKS ON A FILM SUPPORT MOVED RELATIVE TO THE APPARATUS

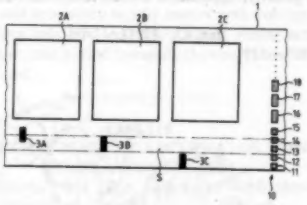
Peter Wydler, Zürich, Switzerland, assignor to Alos AG, Zürich, Switzerland

Filed Jul. 1, 1985, Ser. No. 750,133

Claims priority, application Switzerland, Jul. 20, 1984, 3548/84

Int. Cl.[4] G06K *7/14*

U.S. Cl. 250—570 **2 Claims**



1. A film reader for receiving longitudinally movable film having images thereon and having optically distinctive marks representative of locations of the images, the marks being in any of a plurality of possible lateral locations relative to the direction of motion of the film, the reader comprising

detection means for sensing the presence of said marks, said detection means comprising

an elongated substantially continuous array of a plurality of photoresponsive devices, said array having a total length at least as great as the lateral dimension of said film,

each of said photoresponsive devices having an active light-receiving surface and all of said active surfaces of said devices facing in substantially the same direction in said array; and

means for supporting said array in a fixed position so that said active surfaces are exposed to and directed to receive light from said film and so that the long dimension of said array extends substantially perpendicular to the desired direction of motion of said film, whereby said photoresponsive devices in said array are responsive to changes in the optical characteristics of said film including changes resulting from the presence of said marks to produce electrical signals representative of said changes without regard to uncontrolled lateral relocation of said film or said marks thereon.

4,691,113

LEVEL INDICATOR FOR A LIQUID IN A CONTAINER

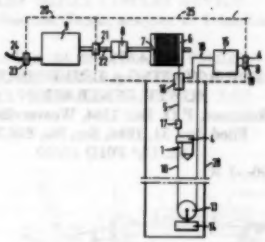
Philippe Corvazier, Montigny les Cormailles, and Jacques Dousteyssier, Rueil-Malmaison, both of France, assignors to The British Petroleum Company p.l.c., London, England

Filed Oct. 11, 1985, Ser. No. 786,643

Claims priority, application France, Oct. 26, 1984, 84 16449

Int. Cl.[4] G01N *21/85;* G01F *23/00*

U.S. Cl. 250—577 **6 Claims**



1. Liquid level indicator comprising (a) totally internally reflecting optical sensor having a light emitter and receiver arranged so that when the optical sensor is in contact with the liquid the total internal reflections of the light from the light emitter to the receiver are reduced, (b) means for moving the optical sensor upwardly or downwardly relative to theliquid level so as to allow the optical sensor to be brought into contact with the liquid, (c) the optical sensor having means for indicating the maximum liquid level, (d) means for signaling the position of the optical sensor with respect to the liquid level and the maximum liquid level comprising a unit providing distinct signals for three logic states corresponding to the sensor in contact with the liquid and not at maximum liquid level, the sensor not in contact with the liquid and not at maximum liquid level, and the sensor at maximum liquid level whether in contact with the liquid or not, and (e) said means for signaling the position of the optical sensor being adapted to actuate said means of moving the optical sensor so as to cause the sensor to sense the liquid level.

4,691,114

ORIGINAL READER WITH VARIABLE MAGNIFICATION AND TIME DELAY

Shizuo Hasegawa, and Kimiyoshi Hayashi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 704,920

Claims priority, application Japan, Feb. 29, 1984, 59-38332; Feb. 29, 1984, 59-38333

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—578 **17 Claims**

1. An original reader comprising:

a plurality of line sensors each consisting of a plurality of photosensor elements, said line sensors being arranged

such that lines read at a given instant by adjacent ones of said line sensors mutually differ;

means for moving said plurality of line sensors and an original relative to each other in a direction perpendicular to a scanning direction of said plurality of line sensors at a speed corresponding to a variable reading magnification of the original; and

means for delaying by a delay time an output from one of said line sensors which scans a line of the original prior to scanning of that line by a second one of said line sensors, said delay time being varied in accordance with the reading magnification of the original.

4,691,115

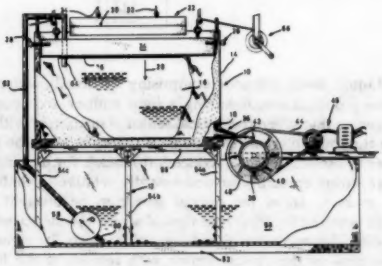
SYSTEM FOR ROTATING A DRIVE MECHANISM FOR POWER GENERATION

Jerry W. Robinson, P.O. Box 1244, Weaverville, N.C. 28787

Filed Jan. 31, 1986, Ser. No. 824,713

Int. Cl.[4] F01D *15/10*

U.S. Cl. 290—1 R **13 Claims**



1. A system for rotating a drive mechanism which can be connected to an electrical generator or the like, said system comprising:

a reservoir means for containing a volume of liquid such as water;

weight means for applying a downward pressure to said liquid in said reservoir means;

weight moving means for moving said weight means proximate an upper portion of said reservoir means whereby said weight means applies a downward pressure to an upper surface of said liquid in said reservoir means;

spout means for discharging liquid exiting said reservoir means, said spout means serving to direct and concentrate discharged water into a stream such that said stream of water can be directed against such drive mechanism for imparting rotational forces thereon;

catch basin means for receiving water discharged through said spout means from said reservoir means, said catch basin means being positioned below said spout means; and

means for moving said water from said catch basin means into said reservoir means.

4,691,116

SWITCH CONTROL DEVICE FOR MOTOR VEHICLE

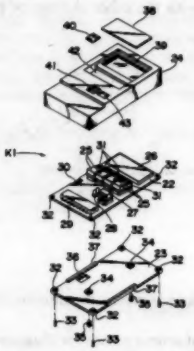
Yasuhiro Kiyono, Nagaokakyo, and Yutaka Takeyama, Toyonaka, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 5, 1985, Ser. No. 762,471

Claims priority, application Japan, Aug. 7, 1984, 59-165323

Int. Cl.[4] H01H *3/14*

U.S. Cl. 307—10 R **13 Claims**



1. A switch control device for a motor vehicle comprising a plurality of switches for actuating a plurality of apparatuses of said vehicle, at least one of said plurality of switches comprising a stop mode switch and a moving mode switch, said device further comprising a means for enabling the stop mode switch or the moving mode switch of said at least one of said plurality of switches, depending on whether or not the vehicle is in motion.

4,691,117

SWITCH DEVICE

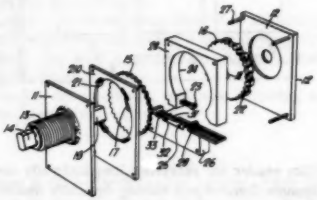
John C. Greenwood, Harlow; Robert J. Hodges, Chesbunt, and Robert Sheppard, Sawbridgeworth, all of Great Britain, assignors to International Standard Electric Company, New York, N.Y.

Continuation of Ser. No. 605,174, Apr. 30, 1984, abandoned. This application Mar. 3, 1986, Ser. No. 837,562

Claims priority, application United Kingdom, May 10, 1983, 8312776

Int. Cl.[4] H01L *41/08*

U.S. Cl. 307—119 **10 Claims**



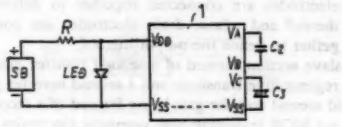
1. A contactless electrical switch, including: a switch element comprising a piezo-resistive body flexibly moving between first and second configurations corresponding to oppositely stressed conditions; said body having an unstressed condition between said oppositely stressed conditions; a rotatable code disc means forcing said body into said configurations; said disc means having an undulated periphery; and means for resiliently urging said body away from its unstressed condition.

4,691,118

SOLAR POWER CIRCUIT

Toshio Nishimura, Jyoyo, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 24, 1985, Ser. No. 779,442
Claims priority, application Japan, Sep. 25, 1984, 59-200785
Int. Cl.[4] H02J 9/00
U.S. Cl. 307—66 **11 Claims**



11. A power supply circuit for supplying power to a load, comprising:

a primary power supply developing a supply voltage during a normal mode;

backup booster charge storage means for storing charge to be supplied to the load during a primary power supply failure mode when said supply voltage is not developed by said primary power supply;

secondary supply means storing charge received from said supply voltage developed from said primary power supply for supply to said backup booster charge storage means during said normal mode, said secondary supply means further receiving charge from said backup booster charge storage means for supply to said load during said primary power supply failure mode; and

control means, operative during said normal mode, for repetitively connecting said second supply means to said primary power supply during a first period and for connecting said secondary supply means in series with said backup booster charge storage means across said primary power supply during a second period to transfer a charge to said backup booster charge storage means at twice said supply voltage;

said control means being operative during said primary power supply failure mode for repetitively connecting said secondary supply means and backup booster charge storage means in series across said load during a first period to apply a difference voltage to said load and charge said secondary supply means with voltage and for connecting only said secondary supply means across said load in a second period to supply the energy stored therein to said load.

4,691,119

PERMANENT MAGNET ALTERNATOR POWER GENERATION SYSTEM

Jack L. McCabria, Lima, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

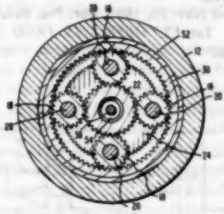
Filed Jun. 20, 1985, Ser. No. 746,819
Int. Cl.[4] H02K 7/10
U.S. Cl. 307—84 **15 Claims**

1. An electrical generating system comprising:

a plurality of permanent magnet alternators, wherein each of said alternators includes a rotor and a stator mounted such that rotation of each of said rotors induces a voltage in a stator winding in an associated one of said stators, and wherein the stator windings of each of said alternators are electrically connected in series;

means for rotating the rotors of each of said alternators at the same speed; and

means for changing the phase angle of the voltage induced in each of said stator windings such that the magnitude of the total voltage across the series connection of said stator windings remains substantially constant as the magnitude



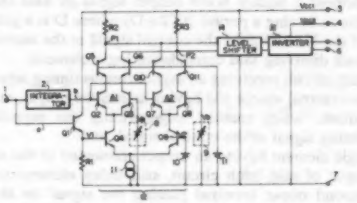
of the voltage induced in each of said stator windings changes.

4,691,120

PULSE DELAY CIRCUIT DEVICE

Hiroshi Kondo, Saitama, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Oct. 28, 1986, Ser. No. 924,022
Claims priority, application Japan, Oct. 29, 1985, 60-241847
Int. Cl.[4] H03K 5/04, 5/22, 5/153, 5/01
U.S. Cl. 307—265 **4 Claims**



1. A pulse delay circuit, comprising:

a double-balanced type differential amplifier means including a first differential amplifier comprising a first differential transistor pair having two input terminals and arranged to provide a first and a second output and a first current source transistor, and a second differential amplifier comprising a second differential transistor pair having two input terminals and arranged to provide a first and a second output and a second current source transistor;

an integrator for integrating an input pulse, said integrator being connected to one of the two input terminals of each of said first and second differential transistor pairs;

a first and a second reference voltage source connected to the other input terminals of said first and second differential transistor pairs, respectively;

a first output stage arranged to combine the first outputs of said first and second differential transistor pairs, and a second output stage arranged to combine the second outputs of said first and second differential transistor pairs; and

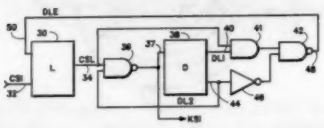
means for causing said first and second current source transistors to be turned on in synchronism with said input pulse so as to render said first and second differential amplifiers operative alternately, so that an output pulse having predetermined delay time and pulse width is derived from each of said first and second output stages of said double-balanced type differential amplifer means.

4,691,121

DIGITAL FREE-RUNNING CLOCK SYNCHRONIZER

John G. Theus, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 29, 1985, Ser. No. 803,262
Int. Cl.[4] H03K 5/13, 19/00
U.S. Cl. 307—269 6 Claims



1. An oscillator circuit, comprising:

a coincidence logic element comprising a NAND gate having a first input receiving a control signal, a second input, and an output, the control signal having first and second logic states;

a delay element having an input terminal connected to the output of said coincidence logic element, and a first output terminal connected to the second input of said coincidence logic element, said delay element passing a signal on the input terminal to the first output terminal after a delay T2, the control signal in the first logic state enabling said coincidence logic element to regenerate on the output thereof a complement of the signal on the second input, thereby generating on the output of said coincidence logic element a square wave output signal of said oscillator circuit having a period 2(T2+D) where D is a gate delay of the NAND gate, the control signal in the second logic state disabling said coincidence logic element;

a latch circuit receiving an asynchronous timing signal from an external source and having an enabling input, said latch circuit, when enabled, regenerating the asynchronous timing signal as the control signal; and

a logic element having an output connected to the enabling input of said latch circuit, said delay element having a second ouput terminal passing the signal on the input terminal after a delay T1 where T1<T2, said logic element receiving the signals at said first and second output terminals of said delay element and generating an enabling output signal, the enabling output signal being disabled during a period of positive to negative transition of the square wave output signal.

4,691,122

CMOS D-TYPE FLIP-FLOP CIRCUITS

Paul G. Schnizlein, and Wen-Tsung F. Tang, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 29, 1985, Ser. No. 717,350
Int. Cl.[4] H03K 3/26, 17/16, 19/096, 3/284
U.S. Cl. 307—279 8 Claims

1. A CMOS D-type flip-flop circuit for avoiding the possibility of feedthrough comprising:

a non-overlapping clock generator section having a true clock output and a complement clock output;

a master section formed of a first transfer gate, a first regenerative transistor and a first inverter gate;

said first transfer gate being formed of a first N-channel MOS transistor with common electrodes and a gate electrode, and said first regenerative transistor being formed of a first P-channel MOS transistor with common electrodes and a gate electrode;

said first N-channel transistor having one of its common electrodes connected to a D input terminal, its other common electrode connected to the input of said first inverter gate and its gate electrode connected to the complement clock output;

said first P-channel transistor having one of its common electrodes connected to a supply potential, its other common electrode connected to the input of said first inverter gate, and its gate electrode connected to the output of said first inverter gate;

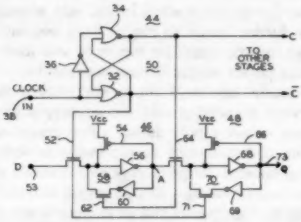
said first inverter gate being formed of a P-channel MOS transistor and an N-channel MOS transistor whose gate electrodes are connected together to define the input thereof and whose drain electrodes are connected together to define the output thereof;

a slave section formed of a second transfer gate, a second regenerative transistor and a second inverter gate;

said second transfer gate being formed of a second N-channel MOS transistor with common electrodes and a gate electrode, and said second regenerative transistor being formed of a second P-channel MOS transistor with common electrodes and a gate electrode;

said second N-channel transistor having one of its common electrodes connected to the output of said first inverter gate, its other common electrode connected to the input of said second inverter gate and its gate electrode connected to the true clock output;

said second P-channel transistor having one of its common electrodes connected to the supply potential, its other



common electrode connected to the input of said second inverter gate and its gate electrode connected to the output of said second inverter gate and to an output terminal;

said second inverter gate being formed of a P-channel MOS transistor and an N-channel MOS transistor whose gate electrodes are connected together to define the input thereof and whose drain electrodes are connected together to define the output thereof;

a first regeneration circuit formed of a third inverter gate and a third N-channel MOS transistor with common electrodes and a gate electrode;

said third N-channel transistor having one of its common electrodes connected to the output of said third inverter gate, its other common electrode connected to the input of said first inverter gate and its gate electrode connected to the true clock output, the input of said third inverter gate being connected to the output of said first inverter gate;

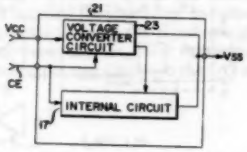
a second regeneration circuit formed of a fourth inverter gate and a fourth N-channel MOS transistor with common electrodes and a gate electrode; and

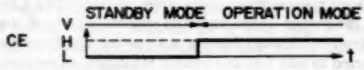
said fourth N-channel transistor having one of its common electrodes connected to the output of said fourth inverter gate, its other common electrode connected to the input of said second inverter gate and its gate electrode connected to the complementary clock output, the input of said fourth inverter gate being connected to the output of said second inverter gate.

4,691,123
SEMICONDUCTOR INTEGRATED CIRCUIT WITH AN INTERNAL VOLTAGE CONVERTER CIRCUIT

Kazuhiko Hashimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 14, 1986, Ser. No. 818,670
Claims priority, application Japan, Jan. 14, 1985, 60-4369
Int. Cl.[4] G05F 3/16
U.S. Cl. 307—296 R 10 Claims



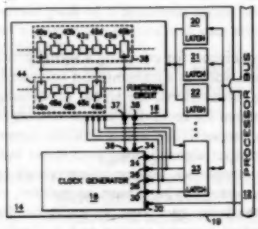


8. Semiconductor integrated circuit apparatus comprising:
internal circuit means for operating from a plurality of power source voltages and for switching between an operation mode during which the level of said plurality of power source voltages differ in value by a first amount and a standby mode during which the level of said plurality of power source voltages differ in value by a second amount greater than said first amount; and
voltage switching means for receiving a control signal indicative of said operation mode and said standby mode, and for supplying said power source voltages to said internal circuit means.

4,691,124
SELF-COMPENSATING, MAXIMUM SPEED INTEGRATED CIRCUIT

Robert C. Ledzius, Chandler, and Steven P. Allen, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 16, 1986, Ser. No. 863,915
Int. Cl.[4] H03K 5/14, 5/135, 3/72
U.S. Cl. 307—303 12 Claims

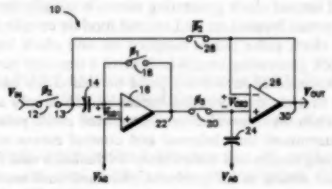


1. A self-compensated integrated circuit comprising:
a functional circuit for performing a dedicated task, said functional circuit being constructed on a substrate, having a clock input node and having a slowest signal path, said functional circuit slowest signal path having a propagation delay associated therewith which is slower than propagation delays for all other signal paths of said functional circuit; and
a clock generator constructed on the substrate and having a clock output node that couples to said functional circuit clock input node, said clock generator operating to generate a clock signal which exhibits a frequency influenced by a propagation delay characteristic of a delay element portion of said clock generator, said delay element portion being constructed from active components and causing a signal propagating through the delay element to exhibit a delay of a predetermined duration relative to the propagation delay of said functional circuit slowest signal path.

4,691,125
ONE HUNDRED PERCENT DUTY CYCLE SAMPLE-AND-HOLD CIRCUIT

Mathew A. Rybicki, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1986, Ser. No. 915,837
Int. Cl.[4] G11C 27/02
U.S. Cl. 307—353 9 Claims



1. A sample-and-hold circuit comprising:
first charge storage means for receiving and storing an input voltage;
a first differential amplifier having a first input coupled to the first charge storage means, a second input coupled to a reference voltage terminal, and an output;
first switching means.,having a first terminal coupled to the first input of the first differential amplifier means, and a second terminal coupled to the output of the first differential amplifier means, for selectively connecting the first input and output of the first differential amplifier;
second charge storage means having a first electrode coupled to the reference voltage terminal, and a second electrode for selectively receiving and storing the output of the first differential amplifier;
second switching means having a first terminal coupled to the output of the first differential amplifier, and a second terminal coupled to the second electrode of the second charge storage means;
a second differential amplifier having a first input coupled to the second electrode of the second charge storage means, and a second input connected to an output thereof for continuously providing a sampled output voltage; and
third switching means having a first terminal coupled to the first charge storage means, and a second terminal coupled to the second input of the second differential amplifier, for coupling the first charge storage means to the second differential amplifier.

4,691,126

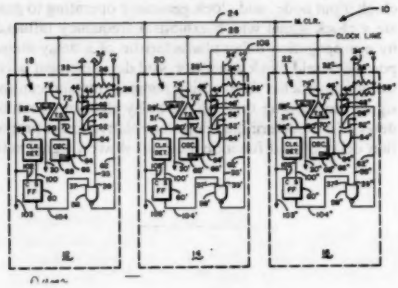
REDUNDANT SYNCHRONOUS CLOCK SYSTEM

Katherine A. Splett, and James A. Howe, both of Burnsville, Minn., assignors to Sperry Corporation, Blue Bell, Pa.

Filed Aug. 29, 1985, Ser. No. 770,461

Int. Cl.[4] H03K *1/00, 17/02*

U.S. Cl. 307—441 **10 Claims**



1. A redundant clock system for an electronic digital logic system that has a common clock bus and is implemented with a plurality of digital clock circuits located on separate modules of said digital logic system comprising at least first and second modules, first and second alternately activatable clock generating means located on said first and second modules, coupled to supply a train of clock pulses to said clock bus from the activated one of said first and second clock generating means, wherein said first clock generating means is initially activated and said second clock generating means is initially deactivated, timing means located on said second module coupled to monitor the clock pulse pulses supplied on said clock bus by said first clock generating means to control a time-out period upon the occurrence of each clock pulse on said clock bus supplied by said first clock generating means and to supply a time-out signal when the interval after a monitored clock pulse exceeds a predetermined time interval and control means coupled to said timing means and constructed to maintain said first clock generator means in an activated state and said second clock generator means in a deactivated state until such time that said timing means has transmitted a time-out signal and to then switch said second clock generator means to an activated state and said first clock generating means to a deactivated state.

4,691,127

ADAPTIVE ELECTRONIC BUFFER SYSTEM HAVING CONSISTENT OPERATING CHARACTERISTICS

Cornelis M. Huizer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 25, 1985, Ser. No. 801,189

Claims priority, application Netherlands, Dec. 5, 1984, 8403693

Int. Cl.[4] H03K *1/02, 17/30*

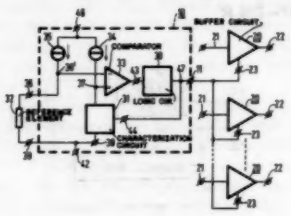
U.S. Cl. 307—475 **8 Claims**

1. An adaptive electronic output buffer system, which comprises:

a set circuit having a set output, said set circuit in operation generating a binary set signal at said output;

a buffer circuit having a signal input, a signal output and a set input which is connected to the set output of the set circuit, said buffer circuit comprising at least two sub-buffers which are connected in parallel between the signal input and the signal output, one of said sub-buffers being a switchable sub-buffer having an activation input connected to the set input and which is selectively set in operation to one of the states of maximum and minimum conductance by said binary set signal at said set output, the set signal at said set output in operation counteracting the effects of manufacturing process variations and operating conditions on the output conductance of the buffer circuit;

a characterization circuit in said set circuit having N inputs, first and second measurement connections, and first and second reference connections, the inputs of the characterization circuit being connected to the set output;



a measurement conductance provided between said first and second measurement connections for providing a measure of the output conductance of said buffer circuit; and

a reference element having a constant conductance connected to said first and second reference connections, said reference element comprising a resistor.

4,691,128

CIRCUIT FOR COUPLING A SIGNAL PROCESSING DEVICE TO A TRANSMISSION LINE

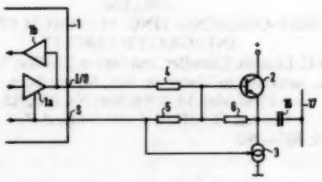
Waldemar Frühauf, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 738,916

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420268

Int. Cl.[4] H03K *17/56, 5/08;* **H03H** *7/38*

U.S. Cl. 307—557 **11 Claims**



1. A coupling circuit for coupling a signal processing device to an I/O device, such as a transmission line subject to substantial impedance fluctuations, the signal processing device having an I/O terminal for receiving and producing both input and output signals, respectively, and a control output for producing a control output signal having two states indicative of the direction of transmission, said coupling circuit comprising:

(a) a first transistor having a base, an emitter, and a collector wherein the latter-two form an emitter-collector circuit;

(b) a controlled current source and a supply source connected in series with the emitter-collector circuit of said first transistor, said first transistor and said current source connected together at a junction coupled to the I/O device;

(c) a first resistor coupling the I/O terminal of the signal processing device to the base of said first transistor;

(d) a second resistor coupling the control output of the signal processing device to the base of said first transistor;

(e) a third resistor coupling the I/O terminal of the signal processing device to the I/O device via the first resistor and

(f) said first transistor and said controlled current source being responsive to the states of the control output signal, said first transistor and said controlled current source both conducting responsive to a first state of said control output signal to provide a first impedance value for an output signal transmitted from the I/O terminal to the I/O device, said first transistor and said controlled current source both non-conducting responsive to a second state of said control output signal to provide a second impedance value for an input signal transmitted from the I/O device to the I/O terminal, and the second impedance value being greater than the first impedance value to increase responsiveness of the signal processing device during reception while the lower first impedance value increases the output signal drive to the I/O device during transmission.

4,691,129

DRIVE CIRCUIT FOR A POWER MOSFET WITH SOURCE-SIDE LOAD

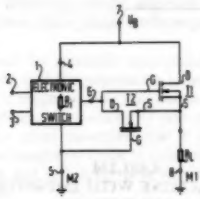
Josef Einzinger, Unterschleissheim; Christine Fellinger, Unterhaching; Ludwig Leipold, Munich; Jenoë Tihanyi, Munich, and Roland Weber, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 16, 1986, Ser. No. 886,578

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1986, 3609236

Int. Cl.[4] H03K *17/687, 3/01;* **H02H** *7/00;* **G05F** *1/40*

U.S. Cl. 307—581 **2 Claims**



1. In a drive circuit for a power MOSFET having a load connected between the source electrode of said power MOSFET and ground potential and with an electronic switch connected between ground potential and the gate electrode of said power MOSFET, the improvement comprising:

the source-drain path of a depletion mode MOSFET being connected between the source and gate electrodes of said power MOSFET; and

the gate electrode of said depletion mode MOSFET being connected to a terminal of said electronic switch for connection to ground potential.

4,691,130

PROCESS FOR THE GENERATION PLASMA AND AN MHD GENERATOR

Franz Gillissen, Abornstrasse 8, Kerpen-Turnich, Fed. Rep. of Germany

PCT No. PCT/EP85/00271, § 371 Date Mar. 10, 1986, § 102(e) Date Mar. 10, 1986, PCT Pub. No. WO86/00180, PCT Pub. Date Jan. 3, 1986

PCT Filed Jul. 5, 1985, Ser. No. 834,324

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421129; May 29, 1985, 3519162

Int. Cl.[4] H02N *4/02*

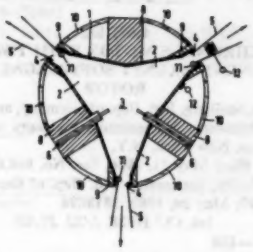
U.S. Cl. 310—11 **20 Claims**

1. A method for generating a plasma by heating a flowing gas comprising the steps of:

providing a cavity which encloses a plurality of flow channels that terminate in a common space, the cavity including gas exit orifices;

establishing magnetic fields having flux lines within each channel, said flow lines being oriented generally parallelly to the axes of the channels;

discharging a gas within each channel to produce a helical flow pattern around the flux lines as the gas moves toward the common space where the helical flows meet each other and form a zone of turbulence;



heating the turbulent gas zone until sufficient electrical energy is generated to effect a self-organized heating up and boost heating of the gas;

whereby Hall currents are established in the heated turbulent gas, the Hall currents producing axially parallel magnetic fields which compress and further heat up the gas to a plasma by the pinch effect; and

exhausting the plasma from the flow cavity, through the gas exit orifices.

4,691,131

STATOR LAMINATE IMPREGNATION IN A LIQUID-COOLED MOTOR

Jiro Nakano, Hino, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

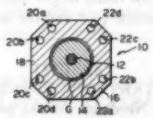
PCT No. PCT/JP85/00633, § 371 Date Jun. 30, 1986, § 102(e) Date Jun. 30, 1986, PCT Pub. No. WO86/03068, PCT Pub. Date May 22, 1986

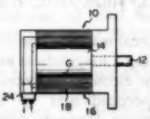
PCT Filed Nov. 13, 1985, Ser. No. 882,981

Claims priority, application Japan, Nov. 14, 1984, 59-238588

Int. Cl.[4] H02K *9/193*

U.S. Cl. 310—54 **3 Claims**





1. A liquid-cooled motor comprising:

a cylindrical rotor;

a hollow tubular stator surrounding said rotor with a gap therebetween, said stator having an unjacketed laminated core composed of a plurality of laminations each having a plurality of holes formed therein so aligned as to form a plurality of cooling liquid passages extending axially with respect to said stator and distributed symmetrically with

respect to an axis of said laminated core as viewed in cross section perpendicular to said axis, said cooling liquid passages being connected at a surface of said stator to external cooling liquid passages provided outside said hollow tubular stator; and

wherein said laminated core is impregnated with a resin to fill gaps between adjacent laminations and coat inner surfaces of said cooling liquid passages so that cooling liquid will flow through said cooling liquid passages without leakage therefrom.

4,691,132

SYNCHRONOUS MOTOR WITH TWO-POLE PERMANENT-MAGNET SOFT-MAGNETIC-CORE ROTOR

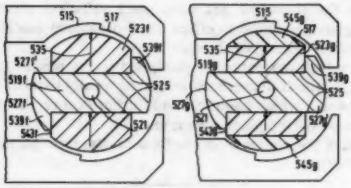
Leo Bertram, Stolberg, Fed. Rep. of Germany, and Hugo Schemmann, Schaesberg, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 21, 1986, Ser. No. 866,033

Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518697; May 24, 1985, 3518696

Int. Cl.[4] H02K *1/22, 21/08*

U.S. Cl. 310—156 **13 Claims**



1. A single-phase synchronous motor comprising a two-pole permanent-magnet rotor between two electromagnetically excited stator poles, the rotor comprising a soft-magnetic block-shaped central part which is diametrally-symmetrical relative to the rotor axis and which has a longer dimension and a shorter dimension transverse to the rotor axis, permanent magnets having magnet poles being arranged on opposite sides of the longer lateral surfaces thus formed, which permanent magnets have directions of magnetization perpendicular to the longer lateral surfaces and have a lower magnetic permeability than the central part, the air gaps between the permanent magnets and the stator being larger than the air gaps between the soft-magnetic central part and the stator.

4,691,133

IRON-FREE ROTARY DISK ELECTRICAL MACHINE

Peter P. Mongeau, Needham, Mass., assignor to Electromagnetic Launch Research, Inc., Cambridge, Mass.

Filed Jul. 8, 1986, Ser. No. 883,344

Int. Cl.[4] H02K *31/02, 1/22, 16/00*

U.S. Cl. 310—178 **33 Claims**

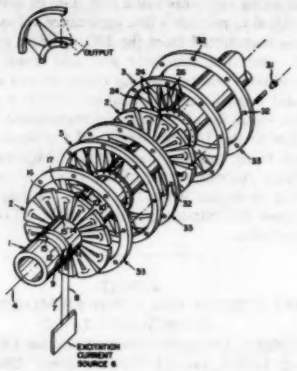
1. A rotary electircal machine comprising:

a drive shaft having a longitudinal axis of rotation;

one or more rotor elements mounted upon said drive shaft substantially perpendicular to the longitudinal axis thereof, said rotor elements comprising non-magnetic disks of high electrical conductivity, each said disk having radial slots therein forming a plurality of current carrying lobes connected in series and defining a meandering current path around said disk;

means for producing excitation current along said meandering path within said disks in a transverse plane with respect to the longitudinal axis of said drive shaft; and

a plurality of stator elements, adjacent said rotor elements, said stator elements comprising first and second sets of substantially radially extending elongated electrical conductors oriented in first and second planes respectively,



transverse with respect to the longitudinal axis of rotation of said drive shaft.

4,691,134

ELECTRIC MACHINE WITH IMPROVED COIL CONNECTION

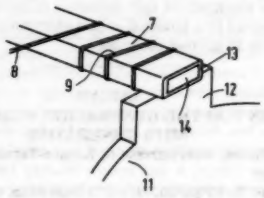
Arend Dijkstra; Bernardus Haijkens, and Mient Veenstra, all of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,918

Claims priority, application Netherlands, May 3, 1985, 8501258

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—234 **3 Claims**

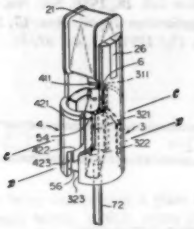


1. Electric machine comprising at least one coil of wire wound about an insulating member and at least two discrete connection elements fixed between said insulating member and collector means of said machine, each connection element comprising a metal core provided with a layer of soft solder, each end of said wire of each coil being embedded in the solder of a respective connection element, each element being soldered to said collector means.

4,691,135
ROTARY DRIVING DEVICE USED FOR ROTARY ACTUATOR

Ichita Sogabe, Gifu; Syuuji Murata, Nagoya, and Yuji Yokoya, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 19, 1985, Ser. No. 799,656
Claims priority, application Japan, Nov. 20, 1984, 59-246429
Int. Cl.[4] H02K *33/00*
U.S. Cl. 310—254 8 Claims

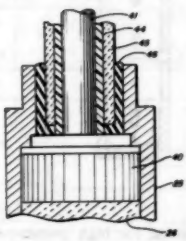


1. A rotary driving device comprising:
a case defining an outer shape of the rotary driving device:
a pair of arcuate stator magnetic poles fixed inside said case and having end faces opposing through gaps;
a rotor of magnetic material rotatably supported inside said stator magnetic pole pair and having two arcuate pole surfaces disposed closely adjacent said stator poles and between two rotor planar surfaces parallel with the axis of rotation;
a rotary shaft for rotatably supporting said rotor; and
an excitation coil for generating a magnetic force between said stator magnetic pole pair and said rotor pole surfaces,
the circumferential positions of said gaps being so changed along the axial direction that a substantially constant rotational magnetic force is maintained between said stator poles and said rotor pole surfaces during rotation of said rotor,
the width of said gaps being smaller than the distance between the two planar surfaces of said rotor.

4,691,136
INSULATOR ASSEMBLY FOR ELECTRODE OF PIEZOELECTRIC IGNITION DEVICE

Frank T. Schmidt, Mulvane, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Dec. 29, 1986, Ser. No. 946,879
Int. Cl.[4] H01L *41/08*; F23Q *3/01*
U.S. Cl. 310—339 9 Claims

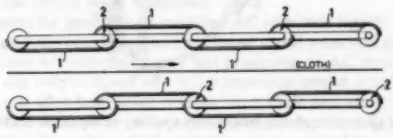


1. In a piezoelectric ignition device having a piezoelectric crystal, a housing surrounding the crystal, and an electrode attached to the crystal and extending outwardly from the housing, an insulator assembly comprising a plastic sleeve surrounding the electrode, a tubular dielectric insulator surrounding the plastic sleeve, and a flexible sealing material between the crystal and the insulator.

4,691,137
ELECTRODE PLATE FOR GENERATING PLASMA

Tokuju Goto, Nara; Itsuo Tanaka, Osaka; Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, all of Japan, assignors to Sando Iron Works Co., Ltd., Japan

Filed Oct. 4, 1985, Ser. No. 784,804
Claims priority, application Japan, Oct. 5, 1984, 59-150961; Oct. 5, 1984, 59-150962
Int. Cl.[4] H01J *7/24*; B23K *9/00*; B08B *3/12*
U.S. Cl. 313—30 3 Claims



1. In an apparatus for treating cloth, said apparatus having at least two spaced electrode plates for use in generating a low temperature plasma, said electrode plates having a long dimension in which the cloth to be treated passes between said spaced electrode plates, said electrode plates including a plurality of electrode plate members having the same shaped configuration and arranged serially in the long dimension of said electrode plates, a plurality of cooling water passages extending transversely of the long dimension of said electrode plates, and for supporting and interconnecting each pair of serially adjacent said electrode plate members, each water passage having an outside surface with a first portion of said outside surface being closer relative to the path of travel of the cloth between two said electrode plates and a second portion of said outside surface being more remote relative to the path of travel of the cloth, and serially adjacent said electrode plate members being inverted relative to one another so that first ones of said electrode plate members extend between the first portions of the outside surfaces of said cooling water passages and second said electrode plate members extending between the second portions of the outside surfaces of said cooling water passages with said first and second electrode plate members being disposed in spaced parallel relation between said cooling water passages, and cooling water communicating pipes interconnecting said cooling water passages laterally outwardly from said electrode plate members.

4,691,138
COLOR PICTURE TUBE HAVING SHADOW MASK WITH VARIED APERTURE COLUMN SPACING

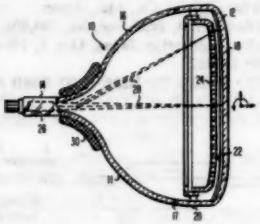
Walter D. Masterton, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 711,721, Mar. 14, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 2,321
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—403 3 Claims

1. In a color picture tube including a shadow mask mounted adjacent to a cathodoluminescent line screen, said shadow mask including a plurality of slit-shaped apertures therein located in columns, said shadow mask having a substantially somewhat rectangular periphery with two opposing long sides and two opposing short sides, a major axis of said mask being an axis passing through the center of the mask and centrally extending through the short sides, and a minor axis of said mask being an axis passing through the center of the mask and centrally extending through the long sides, and said aperture columns generally extending in the direction of the minor axis and being spaced from each other in the direction of the major axis, the improvement comprising

the aperture column-to-column spacing near the minor axis of said mask being less at the long sides of said mask than near the major axis of said mask,

the aperture column-to-column spacing being greater near the corners of said mask than near the major axis, and



the aperture column-to-column spacing along cross-sections parallel to the major axis but off the major axis varying approximately as the equation, $A=a+bx^2+cx^4$, where: A is the column-to-column spacing, a, b and c are different functions of the square of the distance from the major axis, and x is distance from the minor axis.

4,691,139

DISPLAY TUBE HAVING FERROMAGNETIC FIELD SHAPERS TO PREVENT BEAM DEFOCUSSING

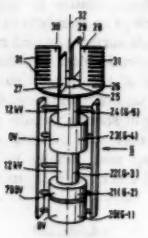
Jan Gerritsen, and Otto Mensies, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 5, 1984, Ser. No. 627,948

Claims priority, application Netherlands, May 7, 1984, 8401444

Int. Cl.[4] H01J *29/50, 29/70*

U.S. Cl. 313—413 **2 Claims**



1. In a display tube comprising an evacuated envelope having a display window, a conical portion and a neck, an electron gun in such neck for generating an electron beam within the envelope which is focussed to form a spot on a display screen on the display window, and a system of deflection coils mounted on said envelope producing pin-cushion-shaped deflection fields for deflecting such spot over the display screen in mutually perpendicular line and field directions; the improvement characterized in that the edge fields of the deflection fields at the electron gun end of the system of deflection coils are made barrel-shaped by means of field shapers, such field shapers comprising two mutually perpendicular pairs of thin, flat plates of ferromagnetic sheet material arranged coaxially around the electron beam and respectively laterally extending away from the electron beam substantially in the line and field deflection directions, both of such pairs of plates being supported on a planar centering member so that the gun ends thereof are at substantially the same distance from said electron gun; whereby such plates minimize defocusing of the electron beam caused by the pin-cushion-shaped deflection fields.

4,691,140

FLUORESCENT LAMP

Yuichi Sakakibara, Yokohama; Yukio Takahashi, Utsunomiya, and Hideharu Shima, Kanuma, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 671,091, Nov. 13, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 890,888

Claims priority, application Japan, Nov. 17, 1983, 58-215028

Int. Cl.[4] H01J *61/44, 61/46*

U.S. Cl. 313—486 **7 Claims**

1. A fluorescent lamp comprising:

a glass bulb having an inner surface, and

a phosphor coating layer contacting said inner surface; said phosphor coating layer comprising lead-activated barium silicate particles and a protective layer comprising alumina particles coating said phosphor particles, the quantity of said alumina particles being at least 0.05% by weight and less than 3% by weight based on the weight of said lead-activated barium silicate particles, and the average diameter of said alumina particles being 0.01 to 0.1 μm.

4,691,141

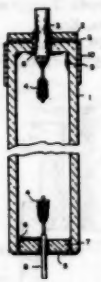
DOSING COMPOSITION FOR HIGH PRESSURE SODIUM LAMPS

Carl F. Buhrer, and Alfred E. Feuersanger, both of Framingham, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 11, 1985, Ser. No. 786,737

Int. Cl.[4] H01J *61/20*

U.S. Cl. 313—565 **15 Claims**

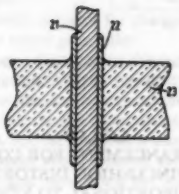


1. A dosing composition for high pressure sodium vapor lamps comprising an admixture of an intermetallic compound of sodium having a melting point in excess of about 600° C. and an intermetallic compound of mercury having a dissociation point of greater than about 600° C., which admisture will react and release sufficient mercury and sodium for the operation of said lamps via the thermal decomposition of the admixture.

4,691,142
ELECTRIC LAMP AND GLASS COMPOSITION

Petrus J. M. Dohmen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 3, 1985, Ser. No. 772,240
Claims priority, application Netherlands, Sep. 19, 1984, 8402866
Int. Cl.[4] C03C 3/093, 3/066; H01J 17/18, 61/36
U.S. Cl. 313—623 3 Claims



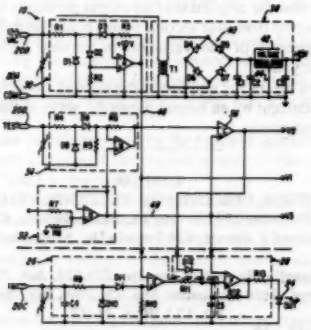
1. An electric lamp comprising a glass envelope and tungsten-current supply wires, which wires are led through the wall of the lamp envelope in a vacuum-tight manner and which have a coating of an intermediate glass over at least that part of their lengths which extends through the wall of the lamp envelope, which coating is fused with the glass of the lamp envelope, which intermediate glass contains SiO_2, B_2O_3, and Al_2O_3 and which, apart from small amounts of impurities, is free from sodium oxide, potassium oxide and lead oxide, characterized in that at least that part of the lamp envelope through which the current supply wires extend inward is made of borosilicate glass and the intermediate glass consists essentially of the following components in the following specified quantities in % by weight:

SiO_2	35–41	MgO	4–10
B_2O_3	12–18	CaO	2–6
Al_2O_3	12–18	BaO + SrO	2–5
ZnO	10–22	Sb_2O_3	0–0.5

4,691,143
CIRCUIT STATUS INDICATING DEVICE WITH IMPROVED SWITCH ON/OFF DETECTION CAPABILITY

Philip E. Lange, Dayton, Ohio, assignor to Aero-Metric General, Inc., Dayton, Ohio

Filed Sep. 5, 1986, Ser. No. 904,387
Int. Cl.[4] H01J 1/60
U.S. Cl. 315—133 18 Claims



1. An improved circuit status indicating device for use in monitoring a circuit to indicate the on/off status of the circuit wherein said circuit conducts an alternating current (AC) operating signal when switched to "on" status and an AC non-operating signal when switched to "off" status, said AC non-operating signal being reduced to a fraction of, and is made out-of-phase with, said AC operating signal by conditioning effects of input circuitry intended to receive said signal, said circuit status indicating device comprising:

indicating means operated from an "off" to "on" condition by a direct current (DC) signal and from the "on" to "off" condition by the absence of a DC signal;

means for receiving and conditioning an AC input signal, said AC input signal corresponding to one of said AC operating and non-operating signals being conducted in the circuit being monitored;

means for generating a modified AC reference signal;

means for comparing said AC input signal with said modified AC reference signal and producing an AC comparison output signal, said AC comparison output signal being, after brief delay of some input cycle periods or fraction thereof, an AC output signal when said AC input signal corresponds to said AC operating signal or an AC output signal when said AC input signal corresponds to said AC non-operating signal;

means for generating a DC reference signal to act as a threshold or switching point for said AC comparison output signal;

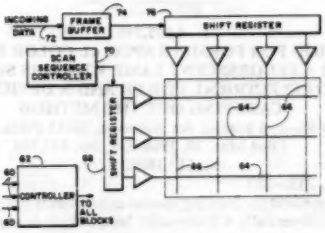
means for comparing said AC comparison output signal with said DC reference signal and producing a DC output signal when said AC comparison output signal, after brief delay of some input cycle periods or fraction thereof, exceeds the predetermined level of said DC reference signal, said AC comparison output signal when corresponding to said first AC output signal being above said level of said DC reference signal or when corresponding to said second AC output signal being below said level of said DC reference signal; and

means for receiving said DC output signal and operating said indicating means from said "off" to "on" condition, and from said "on" to "off" condition in absence of receipt of said DC output signal.

4,691,144
STAGGERED REFRESH PULSE GENERATOR FOR A TFEL PANEL

Christopher N. King, Portland; Brian J. Dolinar, Lake Oswego; William A. Barrow, Beaverton; Robert T. Flegal, Beaverton; Paul E. Gulick, Beaverton, and Laurin G. Blacken, Wilsonville, all of Oreg., assignors to Planar Systems, Inc., Beaverton, Oreg.

Filed Jan. 22, 1986, Ser. No. 821,464
Int. Cl.[4] G09G 3/30
U.S. Cl. 315—169.3 15 Claims



1. In a TFEL panel having a first plurality of scanning electrodes and a second plurality of data electrodes, said first and second pluralities of electrodes being orthogonally dis-

posed with respect to each other and forming a matrix of pixels, the combination comprising:

(a) means for selectively energizing each of said scanning electrodes one at a time until all such electrodes have been energized so as to complete a frame of data;

(b) means for selectively energizing certain ones of said data electrodes simultaneously with the energization of each of said scanning electrodes so as to illuminate selected pixels within said matrix; and

(c) refresh pulse generator means for generating a refresh pulse once per frame of data during a time interval when no scanning electrode is energized, wherein said refresh pulse occurs at a different time during each sequential frame of data with respect to the energization of each of said scanning electrodes.

4,691,145

DRIVE CIRCUIT FOR FLUORESCENT DISPLAY TUBE

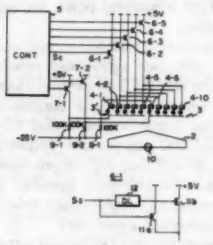
Taizo Satoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 624,548, Jun. 26, 1984, abandoned. This application Dec. 16, 1986, Ser. No. 942,048

Claims priority, application Japan, Jun. 29, 1983, 58-115879

Int. Cl.[4] G09G *3/10*

U.S. Cl. 315—169.3 **12 Claims**



1. A driver circuit for a fluorescent display tube, said driver circuit comprising:

a plurality of first drivers, each for selectively controlling a potential of a corresponding segment of said fluorescent display tube; and

a plurality of second drivers, each for selectively controlling a potential of a corresponding grid of said fluorescent display tube to effect a display operation, each of said first drivers having a plurality of transistor elements and a delay circuit, said plurality of transistor elements being connected in parallel, a control signal for driving said transistor elements being suppled to one of said transistor elements via said delay circuit, the drive timings of said plurality of transistor elements differing from each other, thereby decreasing the transition speed of the output signals of said first drivers.

4,691,146

METHOD FOR FORMING SPECIAL COLOR EFFECTS FROM A FLUORESCENT LAMP WHICH IS SUPPLIED WITH ELECTRICAL POWER AND A DEVICE FOR CARRYING OUT THE METHOD

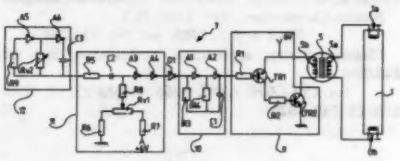
Jacques Roux, 6 passage des Abbesses, 75013 Paris, France

Filed Mar. 10, 1986, Ser. No. 837,746

Int. Cl.[4] H05B *41/16*

U.S. Cl. 315—287 **18 Claims**

1. A method for forming special color effects from a lighting lamp preferentially a fluorescent lamp which is supplied with a.c. electrical current, wherein said method consists in periodically supplying said lamp with the electrical current which is pulsed to flash the lamp to be visible to an observer during an emitting time T1 of the electrical current which is selected so that the cyclic ratio T1/T, where T is the pulsating period, is comprised between 0 and 1, and whose corresponding frequency 1/T is comprised between 1 and 500 Hz; and moving



the lamp in accordance with a relative moving speed V in space such as $0<V\leqq 50$ m/s or $0<V\leqq 50$ rps.

4,691,147

CIRCUIT ARRANGEMENT FOR CORRECTING HORIZONTAL PINCUSHION DISTORTION USING A VOLTAGE PROPORTIONAL TO VERTICAL SYNC PERIOD

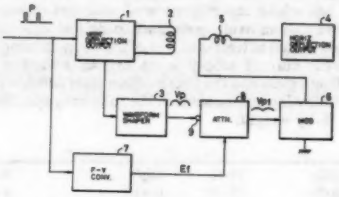
Shigeru Kashiwagi, Iwai, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Jun. 5, 1986, Ser. No. 872,384

Claims priority, application Japan, Jun. 6, 1985, 60-123215

Int. Cl.[4] H01J *29/56*

U.S. Cl. 315—371 **4 Claims**



1. A circuit arrangement for correcting horizontal pincushion distortion arranged to modulate a horizontal deflection current by a parabolic wave signal of vertical deflection period which parabolic wave signal of obtained by waveform shaping a vertical deflection current flowing through a vertical deflection coil of a deflection yoke of a cathode-ray-tube, said circuit arrangement comprising:

(a) first means responsive to vertical synchronous signal for generating a d.c. voltage proportional to the vertical deflection period;

(b) second means responsive to said d.c. voltage from said first means for controlling the amplitude of said parabolic wave signal in substantial proportion to said d.c. voltage such that the amplitude of an output parabolic wave signal outputted from said second means is substantially constant irrespective of the variation in vertical deflection frequency; and

(c) third means for amplitude-modulating horizontal deflection current by an output parabolic wave signal from said second means.

4,691,148

CONTROL CIRCUIT FOR ELECTRIC VEHICLES

Robin P. Nicholls, 250 Dorking Pl., Santa Barbara, Calif. 93105, and Rolland J. Savoie, 434 Venado Dr., Santa Barbara, Calif. 93110

Continuation-in-part of Ser. No. 229,624, Jan. 29, 1981, abandoned. This application Sep. 25, 1984, Ser. No. 653,851

Int. Cl.[4] B60K *41/12*

U.S. Cl. 318—12 **12 Claims**

1. A control system for a vehicle controlled by an operator-movable accelerator movable through a range of distance from

a rest position to a full power position, said vehicle being driven by a rotary electric motor through a variable transmission variable from a high gear ratio to a low gear ratio, said vehicle having a plurality of batteries, comprising:

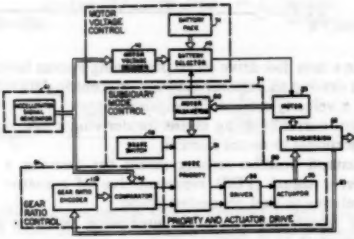
(a) accelerator means for generating digital signals of progressive numbers dependent upon the position of the accelerator in its range;

(b) transmission means for generating digital signals of progressive numbers dependent upon the gear ratio of the transmission;

(c) a transmission actuator for changing the transmission to a higher or lower gear ratio;

(d) a comparator connected to the actuator and to the accelerator means and the transmission means to compare the signals from the accelerator means and the transmission means to operate the transmission actuator to a higher gear ratio when the accelerator number exceeds the transmission number and to operate the transmission actuator to a lower gear ratio when the transmission number exceeds the accelerator number,

(e) and switching means responsive to positions of said accelerator for successively connecting said batteries in series to the motor to obtain a higher voltage as the accelerator is moved toward a greater power position, said transmission numbers being more than the accelerator numbers until at least some of said batteries are connected in series to the motor.



8. A control system for a vehicle controlled by an operator-movable accelerator movable through a range of distance from a rest position to a full-power position and controlled further by an operator-movable brake, said vehicle being driven by a rotary electric motor, said motor also being capable of generating electricity when mechanically driven, said motor being connected to a variable transmission variable from a high gear ratio to a low gear ratio, said vehicle having a source of current, comprising:

(a) a normally open battery switch closed by manually advancing the accelerator to connect the current source to the motor when the accelerator is advanced past its rest position, and which opens when the accelerator is released;

(b) brake switch operated by the brake to operate the battery switch to connect the current source to the motor when the brake is operated;

(c) and a generator voltage sensor interposed between the brake switch and the battery switch to prevent closing of the battery switch except when the generator voltage exceeds the voltage of the current source and to render the brake switch inoperable when the generated voltage of the motor is less than the voltage of the current source;

(d) means for varying the gear ratio of the transmission;

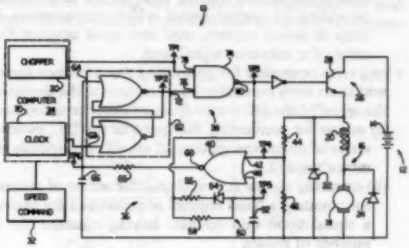
(e) and a regenerative current sensor connected to the means for varying the gear ratio, to thereby vary the motor rpm to obtain a selected range of regenerative current.

4,691,149

APPARATUS AND METHOD FOR PROTECTING A MOTOR CONTROL CIRCUIT

Kenneth A. Baumgartner, Peoria, Ill., and William Pickering, University Heights, Ohio, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed Oct. 11, 1985, Ser. No. 786,580
Int. Cl.[4] G05B 5/00; H02H 7/09
U.S. Cl. 318/331 **3 Claims**



1. Apparatus for sensing a short circuit condition of a motor control circuit, comprising:

a battery having first and second battery poles;

a transistor having an emitter terminal, a base terminal, and a collector terminal connected to one of said battery first and second poles;

a motor having a first motor terminal connected to the other of said battery first and second poles, and a second motor terminal connected to said transistor emitter terminal;

chopper means for controllably producing motor control signals;

clock means for periodically producing a reset signal;

a first logic gate having a second input terminal, an output terminal, and a first input terminal connected to said transistor emitter terminal;

a latch having an output terminal, a first input terminal connected to said first logic gate output terminal, and a second input terminal connected to said clock means; and

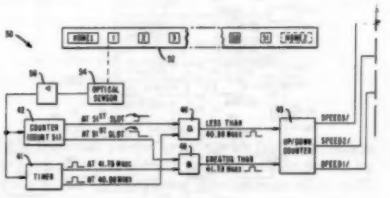
a second logic gate having a first input terminal connected to said latch output terminal, a second input terminal connected to said chopper means, and an output terminal connected to said transistor base terminal and said first logic gate second input terminal.

4,691,150

MOTOR SPEED CONTROLLER

Tai-Kuang Jen, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 20, 1986, Ser. No. 876,575
Int. Cl.[4] G05B 5/00
U.S. Cl. 318—331 **6 Claims**



1. A controller for controlling the speed of a DC motor to which a variable torque is applied comprising:

a DC motor having first and second inputs for receiving power;

a short term controller having;

(i) a power transistor and a diode serially connecting a source of power to said first input of the DC motor, a load current sensing resistor connecting said second input of the DC motor to a power ground,

(ii) an operational amplifier having one input connected to said first input of the DC motor and a second input connected to said second input of the DC motor for providing an output signal which compensates for a drop in motor current, said one input adapted for receipt of a reference signal; and

a long term controller for generating the reference signal for said short term controller as a function of the deviation of the speed of the DC motor from a reference speed having;

(i) means for converting the speed of the DC motor to a series of pulses the spacing of which corresponds to the motor's speed,

(ii) counting means for receiving the series of pulses and for counting a fixed number of pulses and for providing a signal upon said counter having counted the fixed number of pulses,

(iii) timer means commencing its timing upon the occurrence of a first pulse in the series of pulses for providing a first signal corresponding to a time which exceeds the reference speed of the DC motor and a second signal corresponding to the time which is less than the reference speed of the DC motor,

(iv) a logic means connected to receive the provided signal from said counter and said first and second signals from said timer means for providing a less than signal if the counter provided signal occurs at a time which is less than the reference speed of the DC motor and a greater than signal if the counter provided signal occurs at a time which is greater than the reference speed of the DC motor,

(v) up/down counter means responsive to the occurrence of the less than signal and the greater than signal for providing a three-bit output signal which is a function of the occurrences of said greater than or less than signal, and

(vi) summing means for providing said reference signal as a function of the three-bit output signal.

4,691,151

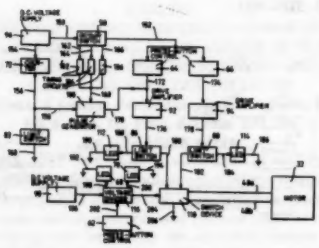
MICROTOME FEED-MOTOR CONTROL

Werner Behme, Banastra, and Manfred Berleth, Schulstrasse, both of Fed. Rep. of Germany, assignors to Cambridge Instruments GmbH, Nussloch Bei Heidelberger, Fed. Rep. of Germany

Division of Ser. No. 696,363, Jan. 30, 1985, which is a continuation-in-part of Ser. No. 691,348, Jan. 4, 1985, abandoned. This application Apr. 25, 1986, Ser. No. 855,659

Int. Cl.[4] G05B *19/24*

U.S. Cl. 318—571 **4 Claims**



1. A microtome feed-motor control comprising

voltage means to generate a first voltage signal and a second voltage signal, said second voltage signal being a multiple of said first voltage signal,

timing means for generating first and second pulses of each of said first and second voltage signals,

said first pulse being of less duration than said second pulse,

first switch means for selecting one of said first and second voltages,

second switch means for connecting said voltage means to said timing means, and

a feed motor responsive to said voltage signals,

whereby the feed motor may be driven at a first or second speed and for a chosen duration.

4,691,152

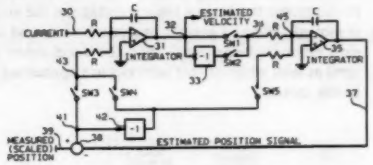
DATA DISK DRIVE VELOCITY ESTIMATOR

Travis E. Ell, and Jeff Stephenson, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 19, 1986, Ser. No. 830,618

Int. Cl.[4] G11B *21/08*

U.S. Cl. 318—616 **7 Claims**



1. In a data disk drive servo positioning system having a DC motor driving an actuator between concentric data track locations, a velocity estimator comprising

motor current sensing means for deriving a first signal proportional to motor current;

measured position sensing means for deriving a position error signal (PES) representative of actuator position relative to said concentric track;

first integrating means for integrating said first signal to generate an estimated velocity;

second integrating means for integrating said estimated velocity to generate an estimated position;

comparison means for comparing said PES and said estimated position and generating an error signal representative of the diference therebetween; and

feedback means for providing a closed loop to feedback said error signal to correct said estimated velocity;

said feedback means comprising circuit means for supplying said comparison means error signal to the input of both said first integrator means and said second integrator means.

4,691,153

METHOD OF CONTROLLING POSITIONING OF ROTOR OF STEPPING MOTOR

Makoto Nishimura, Yokohama, Japan, assignor to Tokiko, Ltd., Kawasaki, Japan

Filed Feb. 7, 1986, Ser. No. 827,169

Claims priority, application Japan, Feb. 9, 1985, 60-24131

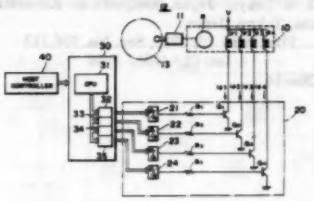
Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **4 Claims**

1. A method of controlling the positioning of a rotor of a stepping motor having phase windings comprising the steps of:

(1) energizing the windings within the last step in a movement of the rotor to a desired rest position thereof so as to produce a first magnetic vector, a position indicated by said first magnetic vector being displaced from said desired rest position of the rotor in the direction of said movement thereof by a predetermined amount so that the rotor is caused to overshoot said desired rest position of

the rotor by such an amount that a positioning error of the rotor due to a hysteresis characteristic thereof in the direction of said movement is compensated; and



(2) subsequently energizing the windings so as to produce a second magnetic vector, a position indicated by said second magnetic vector coinciding with said desired rest position of the rotor.

4,691,154

STEPPING MOTOR CONTROL SYSTEM

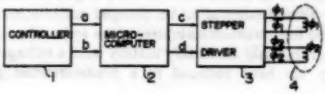
Masahiko Sato, Funabashi; Kazutoshi Kato, Narashino; Akira Ishibashi, Tokyo, and Tsurumasa Matsushita, Narashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1986, Ser. No. 852,756

Claims priority, application Japan, Apr. 16, 1985, 60-79165; Apr. 22, 1985, 60-84484

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **3 Claims**



1. In a positioning mechanism using a stepping motor having a rotor as a drive source, a stepping motor control system comprising:

means for determining that the phase excitation state of said stepping motor has reached a phase excitation state preceding the phase excitation state at a target stop position by a predetermined number of steps; and

control means for transferring the excitation state from one phase excitation state to another phase excitation state by successively decreasing one phase excitation current and successively increasing another phase excitation current, said control means being activated upon arrival of the rotor of said stepping motor at a phase state preceding the phase excitation state at the target stop position by a predetermined number of steps.

4,691,155

AUTOMATIC LOAD SEEKING CONTROL FOR A MOTOR

Noel R. Taylor, 2512 Bonham, and Paul A. Taylor, 1548 Tanglewood, both of Odessa, Tex. 79761

Division of Ser. No. 545,758, Oct. 26, 1983, Pat. No. 4,508,497, which is a continuation of Ser. No. 156,740, Jun. 5, 1980, Pat. No. 4,446,415, which is a continuation of Ser. No. 027,798, Apr. 6, 1979, Pat. No. 4,200,440, which is a continuation-in-part of Ser. No. 854,389, Nov. 23, 1977, abandoned. This application Oct. 15, 1984, Ser. No. 661,229

Int. Cl.[4] H02P *1/32, 7/48, 5/28*

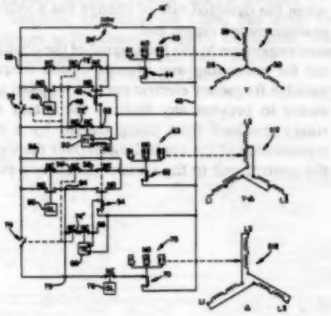
U.S. Cl. 318—771 **19 Claims**

1. A motor control unit for automatically controlling the torque output of a high slip motor for powering a cyclic load which varies from below to above the motor rated current load, said motor including motor starter means connected to motor stator windings and means for altering the electrical configuration of said stator windings, said motor control comprising:

sensor means for detecting the magnitude of the current flow through said motor stator windings during a multiplicity of cyclic loads;

first circuit means for connecting said motor stator windings in a first electrical configuration;

first overload means responsive to said sensor means for automatically altering the electrical configuration of said motor stator windings from said first electrical configuration to a second electrical configuration to increase motor torque output when said current flow exceeds a first preselected value;



first timing means for sensing the time period said motor stator windings are connected in said second electrical configuration; and

first switching means for automatically altering said motor stator windings from said second electrical configuration to another electrical configuration to reduce motor torque output in response to said first timing means reaching a preselected value in excess of a multiplicity of cyclic loads.

4,691,156

VARIABLE FREQUENCY POWER UNIT CONTROLLING SYSTEM

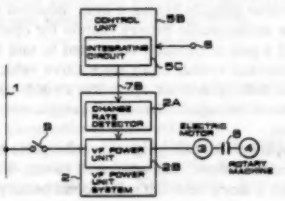
Nobuharu Takata, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1985, Ser. No. 698,850

Claims priority, application Japan, Apr. 2, 1984, 59-65419; Apr. 2, 1984, 59-65420; Apr. 2, 1984, 59-65421

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—798 **9 Claims**



1. A variable frquency power system with fault prevention for controlling the rotary speed of a rotary machine driven by an A.C. electric motor by regulating the frquency of an A.C. electric current supplied to the electric motor, comprising:

a control unit for generating a D.C. electric control signal designating the rotary speed of the rotary machine;

said control unit including an integrating circuit for integrating the control signal to prevent any rate of change of the

control signal from having a value outside a predetermined range;

a signal line connected to the output of the integrating circuit for transmitting the control signal;

variable frequency power means for receiving the control signal from the signal line and for generating the A.C. electric current with a frequency which varies in accordance with the magnitude of he control signal;

said variable frequency power means including a change rate detector for detecting the rate of change in the received control signal and for generating a fault signal when the detected rate of change has a value outside the predetermined range; and

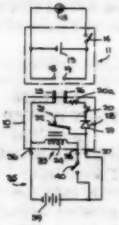
means responsive to the fault signal of the change rate detector for restricting any change of the frequency of the variable frequency electric current supplied to the electric motor to prevent any fault in the rotary speed of the rotary machine from being caused by a disruption of transmission of the control signal over the signal line from the control unit to the variable frequency power means.

4,691,157

BATTERY CHARGING APPARATUS

Julian A. McDermott, 1639 Stephen St., New York, N.Y. 11227

Filed Nov. 19, 1984, Ser. No. 672,624
Int. Cl.[4] H02J 7/00
U.S. Cl. 320—2 **11 Claims**



1. In combination

a portable module having a light mounted thereon, at least one rechargeable battery therein for operating said light, and a pair of contacts connected to said battery;

an electrical system of an automotive vehicle having a second battery and an operation switch connected to said second battery, said switch having a normally open position;

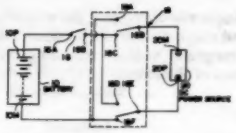
an apparatus for charging said rechargable battery from said second battery, said apparatus having a charging circuit with a diode between said second battery and one of said contacts for said rechargeable battery, means for short circuiting said diode to permit a current flow around said diode, said means including a second switch having a normally closed position to complete a short circuit about said diode and an open position to interrupt said short circuit, and actuating means for actuating said second switch connected with said operation switch to move said seocnd switch to said open position in response to closing of said operation switch.

4,691,158

METHOD OF OPERATING A SECONDARY BATTERY TO RECONDITION THE BATTERY

Takafumi Hashimoto; Yoshihide Kamanaka, and Tadashi Ashikaga, all of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed May 20, 1985, Ser. No. 736,213
Int. Cl.[4] H02J 7/00
U.S. Cl. 320—14 **8 Claims**



1. In a method of operating a secondary battery to recondition said battery, in which said battery includes at least one unit cell using zinc as an active material for a negative electrode in an electrolyte and adapted to be charged add discharged repeatedly, the inprovement comprising the steps of:

(a) discharging said secondary battery until a voltage of said battery has been reduced to a predetermined positive value;

(b) electrically and switchably connecting a positive electrode of said battery to a negative output terminal of a direct current supply means and connecting a negative electrode of said battery to a positive output terminal of said direct current supply means; and

(c) flowing a reversed charging current from said negative electrode to said positive electrode in the electrolyte of said battery from said direct current supply means until said battery voltage has been further reduced below a zero value and has reached a predetermined negative value, to cause the zinc on the negative electrode to be completely dissolved into the electrolyte.

4,691,159

PARTIAL SHUNT SWITCHING LIMITER FOR A SPACECRAFT SOLAR-PANEL OR LIKE POWER-SOURCE ARRAY

Allan F. Ahrens, Acton, and Robert M. Martinelli, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 30, 1985, Ser. No. 771,396
Int. Cl.[4] G05F 5/00
U.S. Cl. 323—222 **12 Claims**

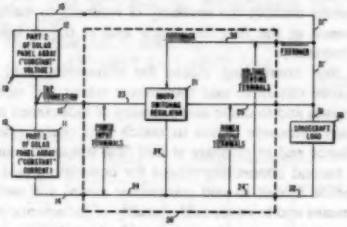
1. A regulating system for electric power sources adaptable for use with an array of solar panels, each solar panel having a generally constant current, variable voltage operating region, each solar panel also having a generally constant voltage, variable current operating region whose output is applied to a load; said system comprising:

a tap connection to such array, dividing such array into first and second portions in series;

said first portion of such solar-panel array operates with all of its solar panels substantially in their generally constant-current operating region; and

said second portion operates with at least some of its solar panels substantially in their generally constant-voltage operating region;

a boost switching regulator having power-input, power-output, and sensing terminals connected so that:



the power-input terminals are across only the first portion of such array, to receive power from only said first portion,

the power-output terminals are across such load, and

the sensing terminals receive a signal which is a measure of the voltage across or current into such load.

4,691,160

APPARATUS COMPRISING A DOUBLE-COLLECTOR ELECTRON MULTIPLIER FOR COUNTING THE NUMBER OF CHARGED PARTICLES

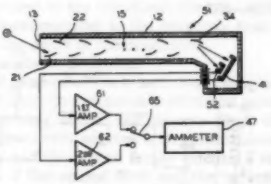
Yoichi Ino, Tokyo, Japan, assignor to Anelva Corporation, Japan

Filed Nov. 8, 1984, Ser. No. 669,603

Claims priority, application Japan, Nov. 11, 1983, 58-211069

Int. Cl.[4] G01N *27/00*

U.S. Cl. 324—71.3 **7 Claims**



1. A number counting apparatus comprising:

a multiplier vessel having an inlet for enabling an entrance of particles, said vessel defining a hollow space in communication with said inlet;

a dynode member having an entrance end adjacent said inlet in said space and an exit end remote from said inlet in said space, said dynode member producing secondary electrons through said exit end in response to a receipt of said charged particles through said inlet and to said entrance end;

a first collector having a first electron receiving surface which is adjacent said exit end of the dynode member in said space, said collector having a first area, said first collector collecting the secondary electrons on said first electron receiving surface to produce a first electric current determined by said first area;

a second collector having a second electron receiving surface which is close to said first electron receiving surface in said space, said second collector having a second area which is smaller than said first area, said second collector collecting a portion of the secondary electrons on said second electron receiving surface to produce a second electric current which is determined by said second area;

first amplifying means responsive to said first electric current for producing a first amplified current;

second amplifying means responsive to said second electric current for producing a second amplified signal;

selecting means coupled to said first and said second amplifying means for selecting either one of said first and said second amplified signals as a selected signal; and

indicating means responsive to said selected signal for indicating the number of said charged particles.

4,691,161

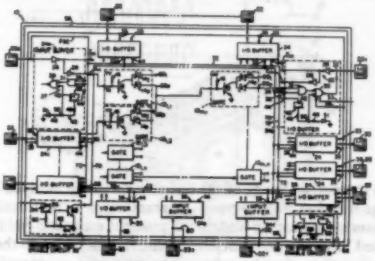
CONFIGURABLE LOGIC GATE ARRAY

Rajni Kant, Milpitas, and Kun-Nan Chen, San Jose, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 13, 1985, Ser. No. 744,349

Int. Cl.[4] G01R *31/26*

U.S. Cl. 324—73 R **4 Claims**



1. An integrated circuit comprising:

(a) an array of logic gates, selected logic gates of the array of logic gates being interconnected to provide predetermined logic functions on a plurality of input logic signals to the gate array and produce said predetermined logic functions as output signals at a selected one or ones of a plurality of array output terminals;

(b) a plurality of buffer circuits, each one of said plurality of buffer circuits being coupled to a corresponding one of a plurality of signal pads, a selected one or ones of said plurality of buffer circuits being further coupled between the selected one or ones of the plurality of array output terminals and the corresponding one or ones of the plurality of signal pads; and

(c) means for electrically decoupling the selected one or ones of the plurality of buffer circuits from the corresponding one or ones of the plurality of signal pads in response to a common control signal applied to a signal pad corresponding to an unselected one of the plurality of buffer circuits, said electrical decoupling means comprising means for electrically coupling said signal pad corresponding to an unselected one of the plurality of buffer circuits to said electrical decoupling means.

4,691,162

METHOD AND DEVICE FOR NMR SPECTROSCOPY

Cornelis M. J. Van Uijen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 447,841, Dec. 8, 1982, Pat. No. 4,527,124. This application Apr. 23, 1985, Ser. No. 726,213

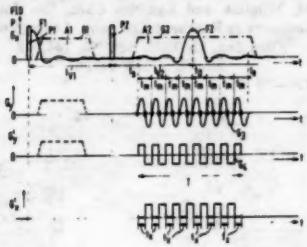
Claims priority, application Netherlands, Sep. 10, 1982, 8203519

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **23 Claims**

1. A method for determining a nuclear magnetization distribution in a part of a body which is situated in a stationary, homogeneous magnetic field which is generated in a first direction, said method comprising the steps of: (a) generating a high-frequency electromagnetic pulse in order to cause a precessional motion of the magnetization of nuclei in the body

around a first field direction so as to generate a resonance signal (b) applying at least one gradient magnetic field during a preparation period (c) applying a further gradient field during a measuring period, said measuring period being divided into a number of sampling intervals of substantially equal duration, (d) periodically extracting n sample signals from the resonance signal during said sampling intervals, and (e) repeating a measurement cycle, comprised of the steps (a), (b), (c) and (d), n' times, wherein an integral of the intensity of at least one gradient field over the preparation period has a different value during successive measurement cycles in order to obtain a group of sample signals wherefrom, after Fourier transforma-



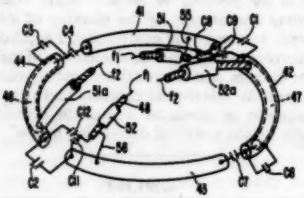
tion thereof, an image of the distribution of the induced nuclear magnetization is determined, characterized in that during said measuring period an additional gradient magnetic field is generated having a gradient direction corresponding to the gradient direction of said gradient magnetic field generated during said preparation period, said additional gradient magnetic field being periodic in time and having a period equal to said sampling interval, wherein the effect exerted on the nuclear magnetization by said additonal gradient magnetic field integrated over a sampling interval is zero, and wherein at least one additional sampling operation is performed after the beginning and before the end of each sampling interval.

4,691,163

DUAL FREQUENCY SURFACE PROBES

Judd Blass, and Hanan Keren, both of Haifa, Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Mar. 19, 1985, Ser. No. 713,689
Int. Cl.[4] G01R *33/08*
U.S. Cl. 324—318 **14 Claims**



1. A radio frequency (RF) surface probe for use in magnetic resonance (MR) systems with transmitter means for transmitting RF pulses which cause samples under test to emit RF signals and with receiver means for receiving said RF signals, the transmitter means and the receiver means having a characteristic impedance, said signals providing data for imaging and/or spectrograph purposes, said probe resonating at least at a first frequency and a second frequency, said probe comprising:

(a) a plurality of inductance means for transmitting said RF pulses to said samples and for receiving said RF signals from said samples;

(b) reactance means for connecting together said plurality of inductance means to form a balanced probe circuit having virtual short circuit planes that minimize electrostatic coupling between the probe and a given sample and thereby minimize loading of the probe by the given sample and enabling the probe to be used with different samples and/or spacing between the given sample and the probe without the necessity of retuning to maintain resonance at the first frequency and at the at least second frequency;

(c) first connecting means for connecting said balanced probe circuit to said transmitter means and said receiver means and to cause said plurality of inductance means and said reactance means to match said characteristic impedance and to resonate at said first frequency; and

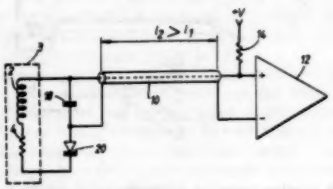
(d) second connecting means for connecting said balanced probe circuit to said transmitter means and said receiver means and to cause said plurality of inductance means and reactance means to match said characteristic impedance and to resonate at said second frequency.

4,691,164

NUCLEAR MAGNETIC RESONANCE TRANSMITTER AND RECEIVER SYSTEM

Motoji Haragashira, Otawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 29, 1986, Ser. No. 901,737
Claims priority, application Japan, Aug. 30, 1985, 60-191779
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 **8 Claims**



1. A tuning circuit for a nuclear magnetic resonance transmitter and receiver system for sensing and coupling an NMR signal to a preamplifier comprising:

a pick-up coil,

a first capacitive element (18) connected in parallel with said pick-up coil, the capacitance of which is associated with a shielded connection means for transferring the NMR signal detected at said pick-up coil to said preamplifier, and

a second capacitive element (20) connected to said coil for forming a resonant circuit in combination with said pick-up coil,

wherein the respective values of said capacitive elements are such that the following condition applies

$$1/C1 + 1/Ct = \text{constant}$$

where Ct is the total capacitance of the first capacitive element and the stray capacitance of the connection means and C1 is the capacitance of said second capacitive element.

4,691,165

METHOD AND APPARATUS INCLUDING SPACED ANTENNAS FOR DETERMINING THE TRACE AND DEPTH OF UNDERGROUND METALLIC CONDUCTORS

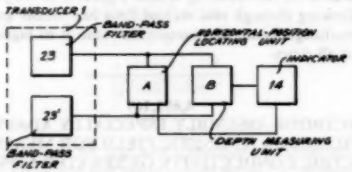
Laszlo Szedlmajer, Zolyomi UT. 29, H-1112 Budapest, Hungary

PCT No. PCT/HU83/00037, § 371 Date Mar. 9, 1984, § 102(e) Date Mar. 9, 1984, PCT Pub. No. WO84/00423, PCT Pub. Date Feb. 2, 1984

PCT Filed Jul. 7, 1983, Ser. No. 596,464

Int. Cl.[4] G01V *3/11*; G01B *7/14*

U.S. Cl. 324—326 **15 Claims**



7. Apparatus for determining the horizontal position and depth of an underground metallic conductor in which there exists an alternating current of a basic frequency which generates a corresponding electromagnetic field having vertical and horizontal components, comprising:

(a) a measuring receiver comprising a transducer, which transducer comprises a first ferrite antenna and a second ferrite antenna, at least one of which is rotatable in a vertical plane, for converting the magnetic field strength into voltage signals;

(b) a horizontal position locating unit electrically connected to the transducer for sensing the voltage signals corresponding to the magnetic field and for pointing out a corridor of a predetermined half-width depending on the depth of the conductor; and

(c) a depth measuring unit, comprising analog circuits, electrically connected to the transducer for sensing the voltage signals corresponding to the magnetic field and for determining the depth of the conductor;

wherein the transducer comprises:

first and second band-pass filters, each comprising inductive elements and capacitive elements in electrical parallel, and further comprising active and passive filter elements, wherein the first ferrite antenna is an inductive element of the first filter and the second ferrite antenna is an inductive element of the second filter and the capacitive elements of the filters comprise capacitors selected such that the resonant frequency of both filters is the Nth harmonic of the basic frequency when a separate generator is not used to generate the alternating current in the conductor, and the resonant frequency of both filters is the Mth harmonic of the basic frequency when a separate generator is used to generate the alternating current in the conductor, wherein (i) N is equal to (CP±1) or (2±C1), (ii) M is CP or 2C, (iii) C is a properly selected integer greater than 1, (iv) P is 1, 2, 3, or 6, and (v) the product CP is an even number.

4,691,166

ELECTROMAGNETIC INSTRUMENTS FOR IMAGING STRUCTURE IN GEOLOGIC FORMATIONS

Larry G. Stolarczyk, Raton, N. Mex., assignor to Stolar, Inc., Raton, N. Mex.

Division of Ser. No. 731,741, May 6, 1985, Pat. No. 4,577,153, which is a continuation-in-part of Ser. No. 483,264, Apr. 8, 1983, abandoned. This application Dec. 23, 1985, Ser. No. 812,625

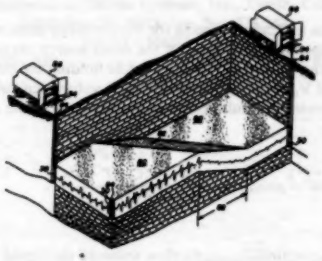
Int. Cl.[4] G01V *3/12, 3/30*

U.S. Cl. 324—334 **12 Claims**

1. Apparatus for the detection and analysis of anomalies within geological formations comprising:

a down hole transmitter set comprising a tuned-loop antenna for orienting vertically within a geological formation, said antenna electrically coupled to a transmitter and mechanically coupled to a drive means whereby said antenna may be rotated about a vertical axis, said transmitter being adapted to transmit continuous wave, narrow band FM signals in a frequency range of approximately 300 KHz to approximately 800 KHz, a modem coupled to said transmitter and to a cable means to connect the transmitter set to surface control equipment, said surface control equipment including means for controlling antenna headings, the transmitter set further including an elongated probe enclosure means enclosing said transmitter, antenna, drive means and modem;

a down hole receiving set comprising a tuned-loop antenna for orienting vertically within said formation, said antenna being electrically coupled to a continuous wave medium frequency receiver capable of receiving signals transmitted by the transmitter set and mechanically coupled to a drive means to rotate said antenna about a vertical axis, said receiver further including measuring and recording means for measuring and recording a plurality of data, comprising signal characteristics of said received signal, a modem coupled to said receiver and to a cable means to connect the receiver set to surface analysis and control equipment, said surface analysis and control equipment including means for controlling antenna headings, the receiver set further including an elongated probe enclosure means enclosing said receiver, antenna, drive means and modem; and



a computer aided processing means for receiving, processing and interpreting said recorded data, said recorded data being stored on a magnetic storage medium by said surface analysis and control equipment for later analysis by the computer aided processing means.

4,691,167

APPARATUS FOR DETERMINING THE ACTIVITY OF AN ION (PION) IN A LIQUID

Hendrik H. v.d. Vlekkert, Groningen, Netherlands, and Nicolaas F. de Rooy, Bole, Switzerland, assignors to Sentron v.o.f., Roden, Netherlands

Filed Aug. 17, 1984, Ser. No. 642,126

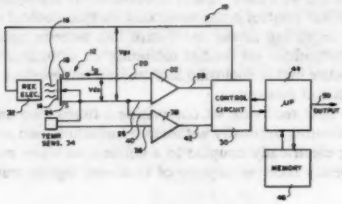
Claims priority, application Netherlands, Aug. 24, 1984, 8302964

Int. Cl.[4] G01N *27/26*

U.S. Cl. 324—438 **4 Claims**

1. An apparatus for determining the activity of an ion (pIon) in a liquid, said apparatus comprising a measuring circuit including a field effect transistor sensitive to the ion (ISFET), a reference electrode adjacent said ISFET, a temperature sensor adjacent said ISFET, amplifying means coupled to said ISFET and to said temperature sensor, a control circuit coupled to said reference electrode and the output of said amplifying means and a computing circuit and memory coupled to said control circuit and having an output providing a temperature compensated signal indicative of ion activity, said apparatus

being operable to maintain two of three parameters which control the operation of the ISFET, namely V_{gs} (gate-source potential), V_{ds} (drain-source potential) and I_D (drain-source current) at a constant value so that the third parameter can be used for determining the ion activity or pIon, while taking into account the temperature dependent pIon sensitivity of the



apparatus and compensating for the normally induced temperature dependent variations of the drain-source current, I_D, by controlling V_{gs} to hold I_D fixed, while holding the drain-source potential V_{ds} fixed, whereby the pIon value is calculated from the following formula stored in the memory of the apparatus:

$$pIon = pIon_{cal.} + \frac{\Delta V_{gs} + T.C.\ \Delta T}{S + (dS/dT)\ \Delta T}$$

wherein:

$pIon_{cal.} = pIon_{calibration}$ = pIon value of the liquid at a given temperature T_C,

T.C. = the variation of V_{gs} with the temperature at $pIon_{cal.}$,

S = the pIon sensitivity at the temperature T_C,

(dS/dT) = the variation of the pIon sensitivity with the temperature, and

ΔT = the difference between the actual temperature and the given temperature T_C.

4,691,168

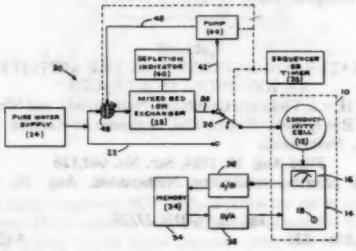
HIGH PURITY WATER CALIBRATING DEVICE

Gregory Dzula, North Caldwell, N.J., assignor to Beckman Industrial Corporation, Cedar Grove, N.J.

Filed Oct. 24, 1985, Ser. No. 791,126

Int. Cl.[4] G01N *27/02*

U.S. Cl. 324—439 **6 Claims**



1. Apparatus for calibrating a conductivity instrument having a conductivity cell and a conductivity measuring instrument operatively associated with said conductivity cell, said apparatus comprising:

a. conduit means for supplying pure water to be measured by said conductivity instrument;

b. first flow line means for supplying said pure water from said conduit means to said conductivity cell;

c. second flow line means for supplying said pure water from said conduit means to said conductivity cell;

d. ion exchange means in said second flow line means for de-ionizing said pure water flowing through said second flow line means; and

e. valve means for selectively supplying said pure water to said conductivity cell, from one of:

i. said first flow line means to provide a conductivity measurement of said pure water; and

ii. said second flow line means to calibrate said conductivity cell, and

f. recirculation means connected to said second flow line means for recirculating at least a portion of the pure water flowing through said second flow line means and the ion exchange means to maintain the same at its highest purity at all times.

4,691,169

ELECTRODE ASSEMBLY ESPECIALLY ADAPTED TO UTILIZING A MAGNETIC FIELD FOR MEASURING ELECTRIC CONDUCTIVITY OF TREATED NON-POLAR LIQUIDS

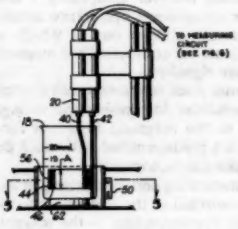
Robert A. Baum, 1932 Altura Dr., Corona Del Mar, Calif. 92625

Division of Ser. No. 20,719, Mar. 15, 1979, Pat. No. 4,313,086.

This application Jul. 8, 1981, Ser. No. 281,441

Int. Cl.[4] G01N *27/42; G01R 27/02*

U.S. Cl. 324—448 **2 Claims**



1. An electrode assembly for measuring electrical conductivity of non-polar liquids; the assembly comprising:

a beaker for receiving said non-polar liquids;

a pair of concentric cylinders radially spaced from one another to form a circumferential gap therebetween, said cylinders being positioned within said beaker to permit said non-polar liquids to flow within said gap;

a pair of electrically isolated connecting rods for connecting said cylinders, respectively, to separate terminals of an electrical circuit and for structurally supporting said cylinders in spaced relation; and

means for imparting a magnetic field in said circumferential gap; said magnetic field imparting means comprising a plurality of magnets spaced equidistantly around the perimeter of said cylinders.

4,691,170

FREQUENCY MULTIPLIER CIRCUIT

Mack W. Riley, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 10, 1986, Ser. No. 837,997

Int. Cl.[4] H03K *3/78, 5/156*

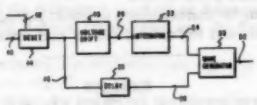
U.S. Cl. 328—20 **16 Claims**

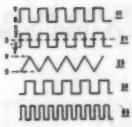
1. A frequency multiplier circuit comprising:

means for receiving an input signal of a first frequency having a signal amplitude symmetrical about a first reference;

means for phase shifting said input signal including means for altering the input signal amplitude to be symmetrical about a second reference, said altering means connected to a means for integrating said altered signal and restoring the input signal amplitude to be symmetrical about the

first reference; means for time delaying said input signal; and





threshold means for logically combining said delayed input input signal and said phase shifted signal for producing an output signal of a second frequency, said second frequency being a multiple of said first frequency.

4,691,171

INTEGRATED RC FILTER WITH RESISTOR TRIMMING

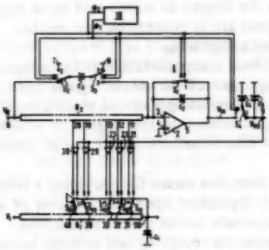
Arthur H. M. Van Roermund, and Petrus M. C. Coppelmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,126

Claims priority, application Netherlands, May 1, 1984, 8401370

Int. Cl.[4] H03K *5/00*; H03B *1/00*; H04B *1/10*

U.S. Cl. 328—167 **14 Claims**



1. A filter arrangement comprising, at least a first resistor and a first capacitor, said arrangement having a time constant determined by the product of the resistance of the resistor and the capacitance of the capacitor, and a trimming circuit for adjusting the time constant of the filter arrangement, characterized in that the trimming circuit comprises: means for generating clock signals, a reference resistor, a second capacitor switchable by at least a first switch cyclically controlled by the clock means, a source of reference voltage coupled to the reference resistor and via said first switch to the second capacitor so that

a first reference voltage is established across the reference resistor and a second reference voltage, which is proportional to the first reference voltage, is established across the second capacitor,

first means coupled to the second capacitor via a second switch cyclically controlled by the clock means for generating a control voltage determined by the difference between the resistance of the reference resistor and the equivalent resistance of the second capacitor, and

second means responsive to said control voltage for short-circuiting a part of the firt resistor, said part, expressed as a percentage of the resistance of said first resistor, being substantially equal to the difference between the resistance of the reference resistor and the equivalent resistance of the second capacitor, expressed as a percentage of the resistance of said reference resistor.

4,691,172

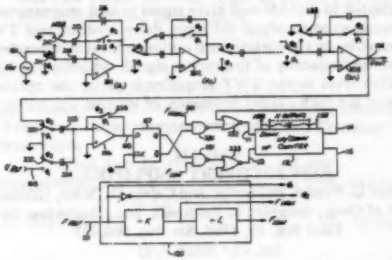
MOS SWITCHED CAPACITOR AUTOMATIC GAIN CONTROL CIRCUIT

Kiyoshi Fukahori, and Thomas Glad, both of Grass Valley, Calif., assignors to Silicon Systems, Inc., Tustin, Calif.

Filed Sep. 10, 1985, Ser. No. 774,544

Int. Cl.[4] H03G *3/20*

U.S. Cl. 330—129 **17 Claims**



1. An apparatus for adjusting the amplitude of an electrical signal to a predetermined level comprising:

an input means for receiving an input analog signal;

an output signal means;

an amplifier network, including a plurality of cascaded sequentially coupled amplifier stages, said input signal means coupled to a first stage of said amplifier network, and a last stage coupled to said output means;

a plurality of capacitors coupled to each said operational amplifier stage for determining the gain of each said operational amplifier stage;

first switching means for selectively coupling said capacitors to said amplifier network for selectively establishing the gain of said network;

a reference voltage source;

a reference frequency means, including a plurality of clocking signals;

a comparator comprising a single operational amplifier coupled to a voltage level of said output signal means and to a voltage level of said reference voltage source, for providing a comparator output signal representative of the comparison of said output signal from said output signal and said reference voltage;

digital conversion means, including a flip-flop and logic circuit means, said digital conversion means converting said comparator output signal from said comparator to a digital signal at a frequency rate determined by said reference frequency source;

and a counter, coupled to receive said digital signal from said digital conversion means for selectively providing control signals to said first switching means at a frequency determined by said reference frequency source.

4,691,173

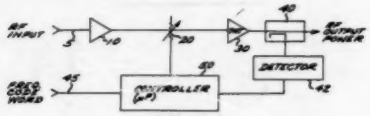
RF INPUT DRIVE SATURATION CONTROL LOOP

Larry R. Mollett, Fullerton, Calif., and Robert W. Goczalk, Acton, Mass., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 740,092, May 31, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 945,250

Int. Cl.[4] H03F 7/00

U.S. Cl. 330—144 **17 Claims**



8. A system for optimizing the RF input drive to a traveling wave tube (TWT) amplifier over an exciter frequency bandwidth, comprising:

programmable means for varying the input drive to the TWT amplifier in response to a drive signal;

means for providing a frequency signal indicative of the exciter frequency; and

controller means responsive to said frequency signal and adapted to provide said drive signal to said programmable means so as to adjust the input drive level of said TWT amplifier to a predetermined optimum level in dependence on the frequency of the exciter signal, whereby the input drive level to the TWT amplifier is set to the optimum level for each exciter frequency of interest.

4,691,174

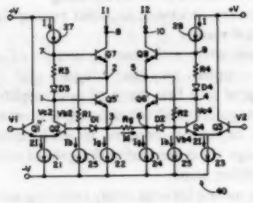
FAST RECOVERY AMPLIFIER

Theodore G. Nelson, Beaverton, and Calvin D. Diller, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 19, 1986, Ser. No. 909,437

Int. Cl.[4] H03F 3/45

U.S. Cl. 330—260 **15 Claims**



1. An amplifier comprising:

first, second, and third nodes;

first and second current sources;

first means for conducting current between said second and third nodes and between said first and third nodes according to a first potential difference between said first and third nodes;

first and second transistors each having an emitter terminal, a base terminal and a collector terminal, the collector terminal of said second transistor being coupled to said first node, the emitter terminals of said first and second transistors being coupled to said first current source, and the base terminal of said second transistor being coupled to said second current source;

resistor means having a first end connected to the base terminal of said second transistor and having a second end;

second means for coupling said third node and the base terminal of said second transistor when a second potential difference between the base terminal of said second transistor and said third node is of a first polarity and for decoupling said third node and the base terminal of said second transistor when said second potential difference is of a second polarity; and

third means for maintaining a constant potential between the first node and the second end of said resistor means

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4,691,175

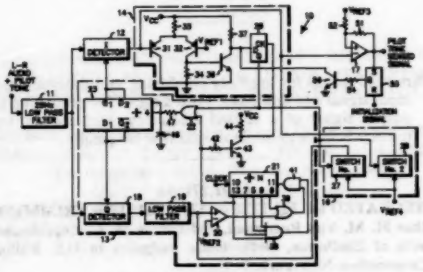
ADAPTIVE PHASE LOCKED LOOP HAVING A VARIABLE LOCKING RATE

Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 14, 1985, Ser. No. 797,735

Int. Cl.[4] H03L 07/06

U.S. Cl. 331—1 A **16 Claims**



1. In a phase locked loop having:

(i) signal input means for receiving an input signal; and

(ii) first phase comparison means for comparing at least some component of said input signal with a second signal having an average phase and for providing an output signal related to the degree to which said input signal and said second signal are in phase with one another;

an improvement comprising:

(A) second phase comparison means for comparing at least some component of said input signals with a reference signal and for providing a second phase comparison means output signal related to the degree to which said input signal and said reference signal are in phase with one another;

(B) polarity detection means for providing a polarity indication signal dependent upon the polarity of said second phase comparison means output signal; and

(C) signal means for receiving said polarity indication signal and for providing said second signal, said signal means having means to selectively vary the average phase of said second signal at a first rate and at a second rate, such that said signal means will provide:

(i) said second signal having said phase that varies at said first rate when said polarity indication signal reflects a phase detector output having a first polarity; and

(ii) said second signal having said phase that varies at said second rate when said polarity indication signal reflects a phase detector output having a second polarity.

4,691,176

ADAPTIVE CARRIER TRACKING CIRCUIT

Chia Y. Hsiung, Phoenixville, and Daniel P. Ross, Philadelphia, both of Pa., assignors to General Electric Company, Fairfield, Conn.

Filed Mar. 17, 1986, Ser. No. 840,220

Int. Cl.[4] H03L 7/10

U.S. Cl. 331—2 **16 Claims**

10. An adaptive carrier tracking circuit comprising:

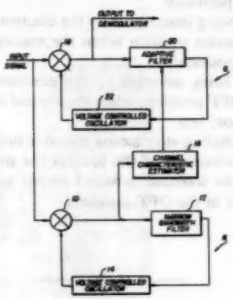
an adaptive filter having an adjustable bandwidth and responsive to a first error signal;

a voltage controlled oscillator for providing a first reference signal coupled to the output of said adaptive filter;

first error means for providing the first error signal as a function of the difference in phase or frequency between an externally derived input signal and the first reference signal;

means for generating a second reference signal in response to a second error signal;

second error means for providing the second error signal as



a function of the difference in phase or frequency between the externally derived input signal and said second reference signal; and

means for estimating the rate of fluctuations of said input signal as a function of variations of said second error signal, said estimating means providing an output signal being adapted to adjust the bandwidth of said adaptive filter;

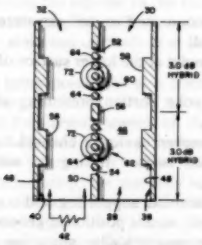
whereby the tracking and noise performance of said circuit is optimized.

4,691,177

WAVEGUIDE SWITCH WITH VARIABLE SHORT WALL COUPLING

Mon N. Wong, Torrance, and Ann L. Peebles, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 2, 1985, Ser. No. 782,809
Int. Cl.[4] H01P *5/12, 5/18*
U.S. Cl. 333—113 **9 Claims**



1. A switch for radiant energy comprising:

a first waveguide, and a second waveguide sharing a common wall with said first waveguide;

an input terminal, a first output terminal, and a second output terminal; said input terminal and said first output terminal being located at opposite ends of said first waveguide; said second output terminal being located in said second waveguide;

a first window and a second window disposed in said common wall and connecting said first waveguide with said second waveguide; each of said windows having a length, as measured along said first waveguide in a direction of energy propagation, equal to approximately one free-space wavelength of the radiant energy, said windows being spaced apart in said direction by a distance greater than approximately one-tenth of the guide wavelength of the radiant energy; and

gate means including a first gate located at said first window for limiting a flow of radiant energy through said first window, and a second gate located at said second window for limiting a flow of radiant energy through said second window; said gate means further comprising

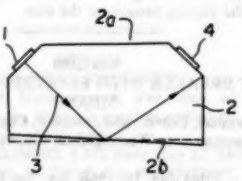
means for displacing said first and said second gates, across their respective windows for opening and closing the respective windows to couple and to decouple said first and said second waveguides, said gate means providing for a maximum amount of power from said first output terminal and essentially no power from said second output terminal upon a closure of both said first and said second gates, said gate means providing a coupling of approximately equal quantities of radiant energy to said first and said second output terminals upon a closure of one of said gates, and said gate means providing for a maximum amount of power from said second output terminal and essentially no power from said first output terminal upon an opening of both of said first and said second gates.

4,691,178

ULTRASONIC DELAY LINE

Takeshi Okada; Haruto Hashimoto, and Michihiko Uemura, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Apr. 23, 1986, Ser. No. 854,930
Claims priority, application Japan, Apr. 23, 1985, 60-85457
Int. Cl.[4] H03H *9/36*
U.S. Cl. 333—143 **10 Claims**



1. An ultrasonic delay line comprising:

an input transducer for producing sound waves depending on an input voltage;

a delay medium having at least one reflecting surface for transmitting said sound waves produced by said input transducer from said input transducer via said reflecting surface to a predetermined location; and

an output transducer disposed adjacent said predetermined location for receiving a portion of said sound waves transmitted in said delay medium to produce an output voltage;

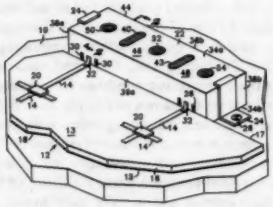
wherein said delay medium has a shape such that sound waves, including a main signal component and third or higher harmonic components, transmittted from said input transducer and through said delay medium via said reflecting surface are misdirected by a predetermined amount in relation to said output transducer such that a substantial portion of the main signal component is input into said output transducer and substantial portion of sound waves having the third or higher harmonic components with respect to said main signal do not reach said output transducer due to said main signal component having a rate of diffusion greater than that of said third or higher harmonic components.

4,691,179

FILLED RESONANT CAVITY FILTERING APPARATUS

Stephen C. Blum, Scottsdale, and John Deriso, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 4, 1986, Ser. No. 937,954
Int. Cl.[4] H01P *1/207, 7/00, 5/08*
U.S. Cl. 333—202 **23 Claims**



1. A filtering apparatus for electrical energy, said apparatus comprising:

an electrically conducting base having a substantially planar surface;

a substantially planar substrate having a ground plane on one side thereof, a conducting trace on an opposing side thereof, and an end substantially perpendicular to both the ground plane and the trace, said substrate being mounted to said base so that said substrate ground plane resides substantially parallel and in contact with the surface of said base;

a solid core mounted on said base proximate the end of said substrate;

a metallic plating clad to said core and having a slot therein extending through said metallic plating to said core, the slot being located proximate the trace of said substrate; and

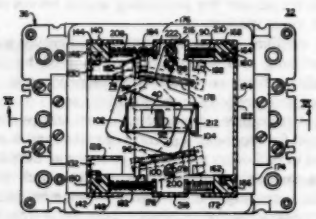
means for connecting the trace of said substrate to said metallic plating proximate the slot.

4,691,180

CIRCUIT BREAKER WITH ELECTRICAL DISCONNECT MEANS

Kurt A. Grunert, Beaver, and Joseph F. Changle, Carnegie, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1986, Ser. No. 875,914
Int. Cl.[4] H01H *75/00, 77/00, 83/00*
U.S. Cl. 335—6 **13 Claims**



1. An electrical circuit breaker comprising:

a pair of separable electrical contacts;

operating means for moving the contacts between OPEN and CLOSED positions;

a bracket engaging the operating means for movement between said positions;

solenoid actuated means for moving the bracket between ON and OFF positions corresponding to the CLOSED and OPEN positions of the contacts, the solenoid actuated means including an electromagnet and an armature separately movable against the bracket for alternately moving the operating means into one of the ON and OFF positions upon successive actuations of the solenoid actuated means;

a bistable mechanical latch having first and second positions for alternately placing the bracket in the ON or OFF position upon successive actuations of the electromagnet;

a manual operator for moving the bracket between the ON and OFF positions;

the bracket being immovable by the electromagnet from the OPEN contact position when the manual operator is in the OFF position;

the bracket being movable by the electromagnet between ON and OFF positions when the manual operator is in the ON position; and

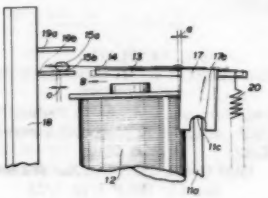
the latch including stop means movable into and out of the path of movement of the bracket for preventing movement of the solenoid actuated means when the manual operator is in the OFF position.

4,691,181

HINGE TYPE RELAY

Kazuji Katsutani, Yokohama, and Shigeru Inaba, Zama, both of Japan, assignors to Niles Parts Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1986, Ser. No. 855,431
Int. Cl.[4] H01H *67/02*
U.S. Cl. 335—128 **22 Claims**



19. A hinge type relay comprising:

an armature,

a contact plate connected to said armature and having an outer plate end,

a lower contact point at the lower surface of said outer plate end,

yoke having a yoke portion presenting an upwardly-disposed surface,

a supporting member having a channel forming a downwardly-disposed surface resting on said upwardly-disposed surface,

said supporting member supporting said contact plate,

an electromagnetic means positioned generally beneath said armature for magnetically attracting said armature towards it,

a first fixed contact point positioned so that said lower contact point contacts it in a generally downward direction when said electromagnetic means is energized,

a biasing means for biasing said lower contact point away from said first fixed contact point, and

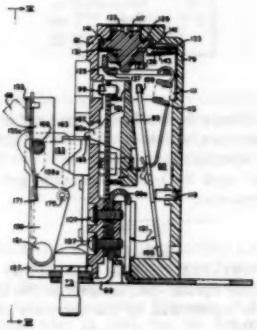
said supporting member rocking on said upwardly-disposed surface when said electromagnetic means attracts said armature towards it and causing said lower contact point, after initially contacting said first fixed contact point, to slide on said first fixed contact point.

4,691,182

CIRCUIT BREAKER WITH ADJUSTABLE MAGNETIC TRIP UNIT

Stephen A. Mrenna, Brighton Township, Beaver County, and Michael J. Whipple, New Sewickley, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1986, Ser. No. 858,137
Int. Cl.[4] H01H 9/00
U.S. Cl. 335—176 7 Claims



1. A circuit breaker structure for responding to abnormal current conditions in an electrical distribution system, comprising:

a circuit breaker mechamism having separable contacts and having a releasable member movable to an unlatched position from a latched position to effect opening of the contacts;

a latch lever movable between latched and unlatched positions of the releasable member and being biased in the latched position;

a trip bar movable to unlatch the latch lever and being biased in the latched position;

a trip unit comprising a stationary magnetic structure for each conductor of the distribution system and including a coil and core assembly and an armature;

lever means associated with the stationary magnetic structure for moving the trip bar to the unlatched position;

the lever means comprising the armature and movable in response to abnormal currents in at least one of the conductors;

the armature being positioned at a constant distance from said assembly;

tension means for varying tension on the lever means and comprising adjustable spring means operatively connected to the lever means so that the force required to attract the armature to the assembly is adjustable without varying the distance between the armature and the coil and core assembly;

the tension means also comprising a manually operable cam and a cam follower;

the cam follower being operatively connected to the spring means for increasing and decreasing tension on the spring means in response to rotation of the cam; and

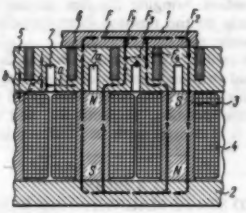
indexing means adjacent to and contacting the cam for positively indicating the position of the cam and comprising a retractable member and spaced member-receiving indentations, one of which is disposed in the housing and the member being biased into the indentations, whereby an adjustable magnetic trip is effected by changing the spring force on the armature.

4,691,183

DEVICE FOR MAGNETICALLY HOLDING WORKPIECES

Arkady Y. Vernikov; Iosif I. Gamarnik; Mikhail P. Rashkovich; Boris A. Trostanovsky, and Alexandr S. Khinkus, all of Odessa, U.S.S.R., assignors to Odesskoe Spetsialnoe Konstruktorskoe Bjuro Spetsialnykh Stankov, Odessa, U.S.S.R.

PCT No. PCT/SU85/00012, § 371 Date Oct. 7, 1986, § 102(e) Date Oct. 7, 1986, PCT Pub. No. WO86/04850, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 13, 1985, Ser. No. 933,747
Int. Cl.[4] H01F 7/20
U.S. Cl. 335—289 1 Claim



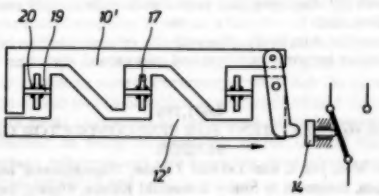
1. A device for magnetically holding workpieces to be machined on machine-tools, comprising a magnetic field source (3, 4) and, disposed thereon, a plate (5) whose side supporting workpieces (1) has recesses (6) for defining poles, characterized in that the plate 5, on its side facing the magnetic field source (3, 4), has auxiliary grooves (7) shifted with respect to the recesses (6) in such a manner that the distance (b) from the bottom of the recess (6) to the side of the plate (5) facing the magnetic field source (3, 4), the distance (a) between the recess (6) and auxiliary groove (7), and the overlap (c) between the recess (6) and auxiliary groove (7) are substantially equal to one another.

4,691,184

BIMETAL RELEASER

Hans-Jürgen Wulff, Hohenwestedt, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

PCT No. PCT/EP85/00492, § 371 Date May 27, 1986, § 102(e) Date May 27, 1986, PCT Pub. No. WO85/02197, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 20, 1985, Ser. No. 866,754
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, 3435228
Int. Cl.[4] H01H 61/00, 71/16
U.S. Cl. 337—49 11 Claims



1. A method for calibrating a bimetal releaser for a switch, the releaser including a release bridge pivotable about an axis, a differential bridge movable relative to the release bridge, a plurality of bimetal strips each having a free release end movable in a given direction as a function of the temperature of said bimetal strip, and a plurality of calibration elements each

mounted at the free release end of a respective bimetal strip and interposed between the release bridge and the differential bridge, the differential bridge being movable into a switch release position when at least one of the bimetal strips is brought to a given temperature, said method comprising:

mounting each calibrating element at the free release end of a respective bimetal strip so as to be movable relative to its respective bimetal strip;

bringing each calibrating element into contact with the release bridge and the differential bridge;

moving the release bridge, the differential bridge and the calibrating elements about the release bridge axis to bring the differential bridge to the switch release position;

while maintaining the differential bridge in the switch release position, bringing the free release end of each bimetal strip to the position corresponding to the given temperature; and

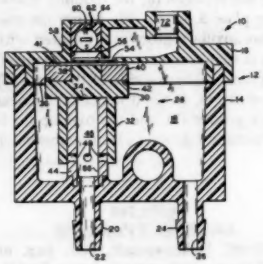
fixing each calibrating element to its associated bimetal strip while said strip and said differential bridge are in respective positions corresponding to the given temperature and the release position, respectively, and said calibrating element is in contact with said differential bridge.

4,691,185

SOLID STATE MAGNETIC MICROSWITCH

Robert J. Loubier, and William F. Bleeke, both of Fort Wayne, Ind., assignors to Xolox Corporation, Fort Wayne, Ind.

Filed Dec. 14, 1984, Ser. No. 681,562
Int. Cl.[4] H05B *43/00*; H01H *9/00*
U.S. Cl. 338—32 H **5 Claims**



1. A switching device which comprises an actuating magnet having a first surface that is the north pole and a second surface opposed to said first surface that is the south pole, an opening extending between said first and second surfaces to provide a magnetic field having a first polarity at a first distance from one of said surfaces and a second polarity at a second distance from said one of said surfaces;

a sensor which changes state when subjected to fields of said first and second polarities;

means for disposing said sensor proximate to said one surface; and

means for selectively changing the relative position of said sensor between said first and said second distances.

4,691,186

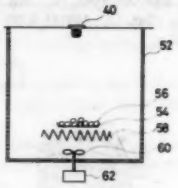
AGING TREATMENT FOR SEMICONDUCTOR GAS SENSOR

Yasuo Shin, Nara, and Takeshi Tanabe, Higashiosaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 20, 1981, Ser. No. 255,489
Claims priority, application Japan, Apr. 25, 1980, 55-56030
Int. Cl.[4] H01L *7/00*
U.S. Cl. 338—34 **5 Claims**

1. A method for stabilizing the operation of a gas sensor prior to its being installed in a cooking apparatus for detecting the cooking condition performed therein which comprises

aging a SnO_2 semiconductor gas sensor by disposing said SnO_2 semiconductor gas sensor in an aging chamber having a gas ambience including a gas which is developed in an apparatus in which said SnO_2 semiconductor gas sensor is desired to be installed, said gas sensor being disposed in



said gas ambience for a sufficient time and at a gas ambience temperature which is effective in achieving said stability of operation; and

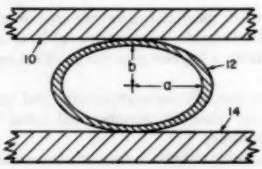
installing said aged SnO_2 semiconductor gas sensor in a cooking apparatus.

4,691,187

VARIABLE LINEAR RESISTOR

George Mon, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 6, 1984, Ser. No. 647,591
Int. Cl.[4] H01C *10/10*
U.S. Cl. 338—114 **2 Claims**



1. A variable linear resistor comprising:

a. a first plate having a recessed area cut into one face;

b. a second plate parallel to and facing the face of said first plate with the recessed area;

c. a length of elastic tubing disposed in said recessed area;

d. means for adjusting the distance between said first and second plates; and

e. means for allowing fluid to flow through said elastic tubing.

4,691,188

CIRCUIT BOARD

Masamichi Watanabe, and Yasushi Watanabe, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

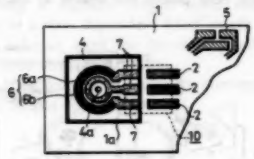
Filed Mar. 10, 1986, Ser. No. 838,286
Claims priority, application Japan, Mar. 8, 1985, 60-33009[U]
Int. Cl.[4] H01C *1/012*
U.S. Cl. 338—307 **3 Claims**

1. A circuit board comprising:

a first insulating film having a hole defined therethrough and a first circuit pattern formed on one surface thereof including a plurality of first connecting terminals formed adjacent to one edge of said defined hole;

a second insulating film having a second circuit pattern formed on one surface thereof including a plurality of second connecting terminals formed adjacent to one edge of said second insulating film, said second insulating film

being retained in said hole of said first insulating film such that said one edges of the respective films are adjacent each other and said first and second connecting terminals are substantially coplanar with each other; and



a heat-seal film having an electrically conductive portion on one side thereof which is placed over said first and second connecting terminals for selectively connecting said terminals of said first and second circuit patterns electrically with each other.

4,691,189

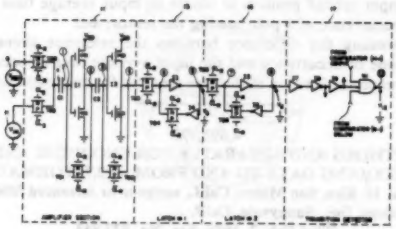
COMPARATOR WITH CASCADED LATCHES

Andrew G. F. Dingwall, Bridgewater Township, Somerset County, and Victor Zazzu, Montvale Borough, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 23, 1986, Ser. No. 866,317

Int. Cl.[4] H03M 1/34

U.S. Cl. 340—347 AD **1 Claim**



1. A comparator comprising:

an amplifying stage having an input and an output;

first means for selectively applying a reference signal to said input of said amplifying stage;

second means for selectively applying an input signal to be sampled to said amplifying stage and for comparing said input signal with said reference signal and for producing a signal at the output of said amplifying stage indicative of the difference between said input signal and said reference signal;

first and second latchable circuits, each one of said first and second circuits having an input and an output, each one of said first and second circuits being operable in either a first mode in which the circuit functions to receive data applied to its input or in a second mode as a regenerative latch;

means for coupling the input of said first circuit to the output of said amplifying stage and means for coupling the output of said first circuit to the input of said second circuit;

means coupled to said first and second circuits for operating said first circuit in said first mode and said second circuit in said second mode during one time interval and for operating said first circuit in said second mode and said second circuit in said first mode during a subsequent time interval; and

a decoding means coupled to the output of said second circuit.

4,691,190

ANALOG-DIGITAL CONVERTER

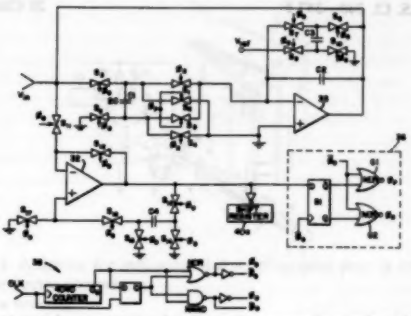
Jeffrey I. Robinson, New Fairfield, Conn., assignor to General DataComm, Inc., Middlebury, Conn.

Division of Ser. No. 822,396, Jan. 27, 1986, Pat. No. 4,667,180.

This application Jan. 28, 1987, Ser. No. 7,715

Int. Cl.[4] H03M 1/44

U.S. Cl. 340—347 AD **6 Claims**



1. An apparatus for the analog to digital conversion of signal, comprising:

(a) a plurality of stages for performing the conversion algorithm $V_{out}=2|V_{in}|-V_{ref}$, wherein V_{in} is the voltage at the input of a particular stage, V_{out} is the voltage at the output of that stage and becomes the V_{in} to the following stage, and V_{ref} is a chosen reference voltage, each stage comprising

(i) a comparator means for comparing V_{in} with a second reference voltage for obtaining a bit of information,

(ii) a first input sampling capacitor,

(iii) a second feedback capacitor, wherein the capacitance of said first input sampling capacitor is twice that of said feedback capacitor,

(iv) a third switch capacitor,

(v) a switching network for permitting the charging and discharging of said input sampling capacitor, said feedback capacitor, and said switch capacitor according to predetermined clocking,

(vi) an operational amplifier having said input sampling capacitor bridging its inverting and noninverting inputs via said switching network, and said feedback capacitor feeding back from the operational amplifier output to its inverting input, wherein

said switching network is arranged to switch the connections of the plates of said input sampling capacitor to said operational amplifier inputs as a function of said clocking and said obtained bit of information from said comparator of said stage to effectuate rectification of V_{in}, and wherein said switching network is arranged to switch the connection of said switch capacitor as a function of said clocking from being connected to the output of said operational amplifier to being between the source of said chosen voltage reference and said inverting input of said operational amplifier, and

(b) a plurality of shift registers, each shift register corresponding to a particular stage and having a storage capacity of m bits of information, where m is chosen from ϕ to n−1 and is the number of said particular stage with n−1 representing the most significant bit and ϕ representing the least significant bit, wherein n is the number of bits output by said analog to digital converter, wherein the output of said shift registers provides an output word in Gray code.

4,691,191

DEVICE FOR SIGNAL PROCESSING AND TARGET PLATE FOR SUCH A DEVICE

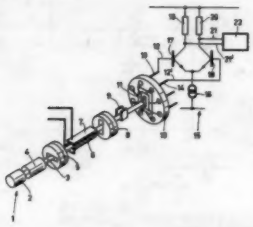
Arthur M. E. Hoeberechts, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 478,973, Mar. 25, 1983, abandoned. This application Jul. 10, 1986, Ser. No. 883,852

Claims priority, application Netherlands, Apr. 20, 1982, 8201630

Int. Cl.[4] H03K *13/00*

U.S. Cl. 340—347 P 20 Claims



1. A device for converting an analog input signal into corresponding digital signals comprising

source means for generating a flat electron beam,

deflection means for deflecting said electron beam depending on an analog input signal,

target means for receiving the deflected electron beam, said target means comprising

a semiconductor body having a main surface,

a first set of radiation-sensitive semiconductor elements at said main surface, said first set of semiconductor elements being covered with a first portion of a pattern, said pattern being of a material substantially opaque to radiation, and

a second set of radiation-sensitive semiconductor elements at said main surface, said second set of semiconductor elements being substantially completely covered with a second portion of said pattern, said second portion being substantially complementary to said first portion of said pattern,

wherein said radiation-sensitive semiconductor elements produce a number of digital signals, said digital signals representing a number of discrete states of said analog input signal.

4,691,192

METHOD AND APPARATUS FOR MEASURING ANGULAR DISPLACEMENT

Alan J. Baker, 10329 33rd Ave., SE., Everett, Wash. 98204

Division of Ser. No. 479,043, Mar. 25, 1983, Pat. No. 4,630,033. This application Aug. 27, 1986, Ser. No. 901,094

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 P 8 Claims

1. A method of measuring angular displacement comprising the step of:

rotating a multi-pole rotor about an axis;

producing a periodic signal from the passage of poles on the rotor past a sensor journalled about the axis for orbital movement along the periphery of the rotor;

generating an index mark once each revolution of the rotor as a selected pole passes a selected location on the periphery;

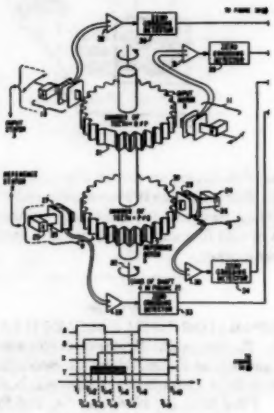
positioning the sensor to a reference orbital position;

measuring for an integral number of revolutions beginning upon and relative to a first index mark the times at which each pole passes the sensor at the reference orbital position;

averaging the times obtained by the measuring step at the reference orbital position to obtain a reference average time of occurrence of a pole passing the sensor;

positioning the sensor to an input orbital position;

measuring for an integral number of revolutions beginning upon and relative to a second index mark the times at which each pole passes the sensor at the input orbital position;



averaging the times obtained by the measuring step at the input orbital position to obtain an input average time of occurrence of a pole passing the sensor; and

expressing the difference between the reference average time of occurrence and the input average time of occurrence as a fraction of the time required for one revolution.

4,691,193

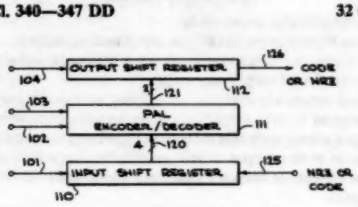
METHODS AND APPARATUS FOR ENCODING AND DECODING DATA TO AND FROM A (2,7) FORMAT

Arthur H. Khu, San Mateo, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 7, 1986, Ser. No. 827,843

Int. Cl.[4] H03M *7/00*

U.S. Cl. 340—347 DD 32 Claims



1. Apparatus for implementing a state dependent fixed length, fixed rate (2,7) coding scheme, used for converting, at said fixed rate, each of the data bits of a serial input data stream to a state dependent, fixed length (pair) of code bits, where successive pairs of said code bits are output serially as part of an output code stream which corresponds to said input data stream in coded form, comprising:

(a) means for receiving at least three successive bits of data from said data stream wherein a first one of said bits is a data bit to be encoded, immediately followed by two of said bits which constitute a first lookahead bit and a second lookahead bit;

(b) means, coupled to said means for receiving for synchronously outputting in parallel the set of bits comprised of

said bit to be encoded and said first and second lookahead bits;

(c) means, responsive to the output of said means for receiving, constructed from a variable length (2,7) code dictionary and having a preselected initial state, for effectively converting a variable length fixed rate (2,7) coding scheme to a state dependent fixed length fixed rate (2,7) coding scheme, used for developing said fixed length output code stream; and

(d) means, coupled to said means for converting, for receiving said output code stream.

4,691,194

ELECTRIC ALARM SIREN WITH ARC-LIKE RUNNER LEGS

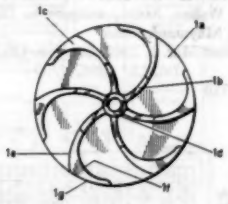
Janez Kavcic, Zelezniki, Yugoslavia, assignor to Iskra-Sozd elektrokovinske industrije n.sol.o, Ljubljana, Yugoslavia

Filed Aug. 14, 1984, Ser. No. 640,574

Claims priority, application Yugoslavia, Oct. 11, 1983, 2052/83

Int. Cl.⁴ E01F *9/00*

U.S. Cl. 340—405 **1 Claim**



1. A lower power electric alarm siren comprising: a central cylindrically shaped member divided by a partition wall into a first portion with slots along the circumference of said first portion and a second portion with fixing accessories for a motor; a runner rotatably mounted within said first portion of said central member, said runner having low ribs and high blades; a front part extending axially outboard from said first portion and having a funnel-shaped nozzle that is open at an axial front end of the siren and that forms a round bore terminating proximate said runner; an electromotor coupled to said runner and to said second portion; and a cover for said electromotor, wherein said runner includes a circular plate having a flat axially inboard back, a convexity at the radially inward portion of the axially outboard front thereof, a bore through the center of said plate for a shaft of said electromotor, said convexity radially extending as a continuity into said low ribs and into said higher blades; and ribs and blades being arc-shaped and continuously curved along the radial extent thereof such that the radially outer portions of said blades tangentially approach the circumference of said runner, said radially outer portions of said blades being formed into air cutters each having a circumferential span, the outer arc of each said blade being shorter than the inner arc thereof, the outer arc being approximately as long as said air cutter, and the blades defining radially outermost circumferential spaces between said air cutters, said spaces being as long as the circumferential span of said air cutters.

4,691,195

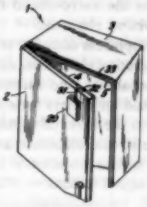
SELF-CONTAINED REFRIGERATOR OPEN DOOR INDICATOR

Jesse L. Sigelman, 69 East 71 St., New York, N.Y. 10021, and Saul Miodownik, West Hempstead, N.Y., assignors to Jesse L. Sigelman, New York, N.Y.

Filed Feb. 26, 1985, Ser. No. 705,582

Int. Cl.⁴ G08B *13/08*

U.S. Cl. 340—545 **14 Claims**



1. A device for indicating that a refrigerator door is open, the device comprising:

a housing;

means for mounting the housing on a refrigerator in the vicinity of its door during use;

transducer means mountable at a refrigerator door gasket for changing an electrical parameter in response to the movement of the refrigerator door from its closed position to an open position, wherein the transducer means comprises capacitive sensor means including two electrically conductive coplanar plates having an insulating base and a dielectric layer thereover and adhesive means on the base for connecting the base to a gasket on the refrigerator;

circuit means disposed in the housing for sensing the change in the electrical parameter of the transducer means to produce an alarm after a preselected time delay.

4,691,196

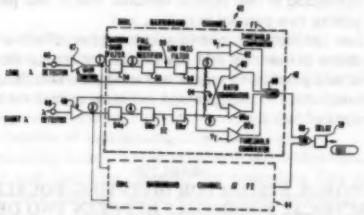
DUAL SPECTRUM FREQUENCY RESPONDING FIRE SENSOR

Mark T. Kern, Goleta, and Kenneth A. Shamordola, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Mar. 23, 1984, Ser. No. 592,611

Int. Cl.⁴ G08B *17/12*

U.S. Cl. 340—578 **23 Claims**



4. A dual channel fire sensor circuit comprising:

a first detector adapted to generate an electrical signal in response to long wavelength radiation;

a second detector adapted to generate an electrical signal in response to short wavelength radiation;

a plurality of dual narrowband channels connected in parallel to said first and second detectors for processing said electrical signals, each of said plurality of dual narrowband channels comprising first and second signal process-

ing paths including a narrowband filter at each of the inputs thereof of like passband characteristics, a threshold circuit coupled in series with the output of said narrowband filter and logic means for providing an output signal in response to corresponding electrical signals at the outputs of the threshold circuits of both of said first and second signal processing paths; the narrowband filters in any one of said plurality of dual narrowband channels being different and non-overlapping in passband characteristics from the narrowband filters in the other of said dual narrowband channels;

a pair of pre-amplifiers coupled to the outputs of the corresponding radiation detectors, each pre-amplifier having a large gain variability, and automatic gain control circuitry coupled to said amplifiers for controlling the gain thereof in response to the level of signals developed in the signal paths of one of said channels; and

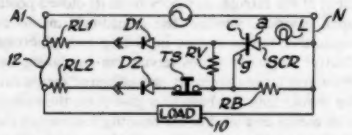
output gating means responsive to said output signals for providing a signal indicative of the detection of radiation.

4,691,197

BLOWN FUSE INDICATOR

Michael A. Damiano, Germantown, and Richard F. Schmerda, Oak Creek, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 24, 1985, Ser. No. 748,106
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—638 **27 Claims**



1. A blown fuse indicator comprising, in combination:

a power supply source;

an indicator;

a solid state switching device having a pair of switching terminals and a control terminal, said switching terminals being connected in circuit with said indicator across said source;

a control circuit for said solid state switching device comprising:

a voltage divider connected across said source, said voltage divider having two parts with a junction there between connected to said control terminal, one of said parts comprising two parallel branches; and

a fuse connected in one of said branches effective when it opens to interrupt said one branch for raising the voltage at said junction to render said solid state switching device conductive to energize said indicator to indicate the open state of said fuse.

4,691,198

CONTROL SYSTEM FOR DIVERTING/EQUALIZING ELECTRICAL POTENTIALS BETWEEN TWO OBJECTS

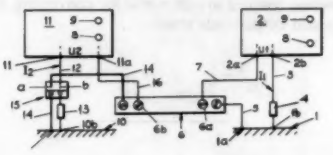
Alf Mortensen, "Bloksberg", Solhola, N-5300 Kleppestø, Norway

PCT No. PCT/NO84/00059, § 371 Date Jul. 24, 1985, § 102(e) Date Jul. 24, 1985, PCT Pub. No. WO85/02601, PCT Pub. Date Jun. 20, 1985
PCT Filed Dec. 14, 1984, Ser. No. 762,150
Claims priority, application Norway, Dec. 16, 1983, 834639
Int. Cl.[4] G08B *21/00*; H02H *11/00*; B67D *5/32*; H05F *3/00*
U.S. Cl. 340—649 **14 Claims**

7. A control system for diverting and equalizing electrical potentials between two objects such as a body of a storage tank and a body of a delivery tank of transporting means during loading flammable or explosive fluids comprising

an electrical equalizer connection connecting the said transporting means via a terminal of the delivery tank of transporting means to the storage tank via a storage tank terminal, at least one said delivery tank and storage terminal is a part of a control circuit,

said control circuit comprising a low voltage source, a resistor, indicator means for registering a current flow, said indicator means controlling and blocking connection and disconnection of a fluid pump by means of signals, said storage tank and said delivery tank terminals are connected to the control circuit via independent control terminals including a storage tank and delivery tank control terminal of the body of the storage tank and the body of the delivery tank, and a control terminal of the equalizer connection.

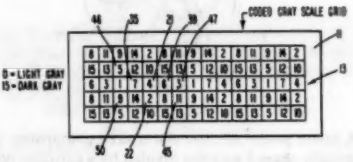


4,691,199

CURSOR POSITION CONTROLLER

Stanley Shell, Waban, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 5, 1985, Ser. No. 730,305
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—710 **5 Claims**



1. A system to be used with an electron beam display device, which display device has means to position a cursor, by coordinate control signals, and with said system designed to enable said cursor to be selectively and randomly moved to random display positions on said display device, comprising in combination: transducer means having light source means and light sensitive means for generating analog signals each of whose amplitude is commensurate with the amount of light reflected from a surface to said light sensitive means at the time of analog signal generation; surface means having a plurality of discrete area means each of which lies in abutting relationship with N other discrete area means and each of which is formed to partially absorb and partially reflect light transmitted thereto from said light source means; each of said discrete area means being formed to absorb a different amount of light each of the discrete area means which lies in abutment therewith and each of said N other discrete area means being formed to absorb a different amount of light then every other discrete area means of said N other discrete area means; each of said discrete area means being formed to reflect a different amount of light than each of the discrete area means which lies in abutment therewith and each of said N other discrete area means being formed to reflect a different amount of light than every other discrete area means of said N other discrete area means; said light sensitive means being capable of generating an analog

signal for each discrete area means, which has an amplitude which is different from the amplitude value of any analog signal generated in response to light reflected from abutting ones of said discrete area means; data processing circuitry means coupled to said transducer means to receive said analog signals, said data processing circuitry means including means responsive to particular combinations of amplitude values of said analog signals to determine the direction said transducer means is moved from a first discrete area means to a second discrete, abutting area means and to generate coordinate control signals indicative thereof; and control signal means connected between said data processing circuitry means and said electron beam display device to conduct said coordinate control signals to said means to position said cursor whereby said cursor is moved in accordance with the movement of said transducer means.

4,691,200

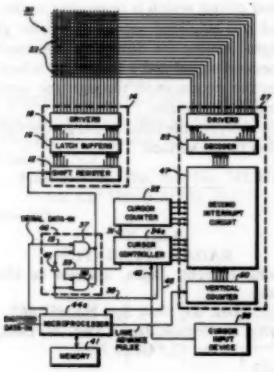
MATRIX DISPLAY WITH A FAST CURSOR

Joseph F. Stephany, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 1, 1984, Ser. No. 656,191

Int. Cl.[4] G09F 9/35; G06F 3/147

U.S. Cl. 340—784 **7 Claims**



1. In a matrix-addressed display device of the type having at least two mutually perpendicular, spaced arrays of electrodes which form a matrix of crossed electrodes, the electrode arrays sandwiching a display medium responsive to electrical fields generated between the crossed electrodes when they are addressed with a voltage, an independently positionable displayed cursor, and means for refresh cycling information displayed on the display device at a frequency faster than the relaxation time or information fading time of the display medium when the electric fields are removed, a means for repositioning the cursor faster than the refresh cycling time for the entire matrix comprising

a first interrupt circuit through which serialized streams of digitized data in the form of voltage pulses are transmitted to the display device matrix through a horizontal circuitry, the horizontal circuitry enabling concurrent addressing of the electrodes in one array with said digitized data voltage pulses, the first interrupt circuit being adapted to interrupt the serialized data streams in response to receipt of a first interrupt signal;

a second interrupt circuit in a vertical circuitry from which line-advance voltage pulses are sequentially transmitted to the electrodes of the other array in the display device matrix in timed relationship with the concurrently addressed electrodes of the other matrix array to create displayed information in said display device medium, the second interrupt circuit being adapted to interrupt the line-advance pulses in response to receipt of a second interrupt signal;

a cursor input device for generating cursor positional information;

a cursor controller for generating the first and second interrupt signals in response to changed cursor positional information and for converting the changed positional information into serialized streams of digitized positional information the cursor controller transmitting the serialized streams of positional information to the first interrupt circuit and concurrently activating a cursor counter that transmits cursor line-advance voltage pulses to the second interrupt circuit in timed relationship with the positional information serial streams; and

said first and second interrupt circuits being further adapted to transmit the serialized streams of positional information and cursor line-advance pulses respectively to the display device matrix while said first and second interrupt circuits are in an interrupted state, whereupon, at the conclusion of this transmission to the display device the cursor controller ceases to generate the first and second interrupt signals, removing the first and second interrupt circuits from said interrupted state.

4,691,201

ENCODED SIGNAL DEVICE WITH SELF-CONTAINED CLOCK GENERATION

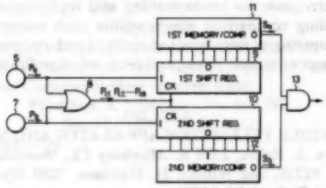
Sadao Kokubu, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Continuation of Ser. No. 679,555, Dec. 7, 1984, abandoned. This application Jul. 2, 1986, Ser. No. 881,582

Claims priority, application Japan, Dec. 7, 1983, 58-189469[U]; Dec. 22, 1983, 58-197469[U]

Int. Cl.[4] H04Q 1/00

U.S. Cl. 340—825.31 **14 Claims**



1. An encoded signal generating device comprising:

an operation member containing first and second rows of coded indicators containing n timing positions, said coded indicators being capable of assuming one of two mutually exclusive states and each of said rows of coded indicators being capable of representing 2^n possible values;

pulse generating means, cooperating with said coded indicators in said operation member, for generating first and second data trains of pulses from relative movement of said operation member and said pulse generating means, said first and second data trains corresponding to sid coded indicators in said first and second rows, respectively;

means for combining said first and second pulse data trains to produce a synchronizing signal comprising a plurality of pulses each approximately synchronized with a pulse of at least one of said first pulse data train and said second pulse data train; and

means for storing said first and second pulse pulse data trains under the control of said synchronizing signal.

4,691,202

IDENTIFICATION SYSTEMS

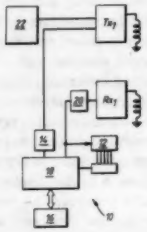
Phillip R. M. Denne, 70 Systems Limited, Unit 7, The Alpha Centre, Upton Road, Poole, Dorset, and Christopher D. Hook, 21 Chantry Close, Windsor, Berkshire, both of England

Filed Apr. 3, 1985, Ser. No. 719,551

Claims priority, application United Kingdom, Apr. 3, 1984, 8408538

Int. Cl.[4] H04Q *7/00*; G07D *7/00*; G06K *5/00*

U.S. Cl. 340—825.54 **10 Claims**



1. An identification system comprising an interrogator and a plurality of transponders;

the interrogator having transmission means for transmitting an interrogation signal;

each transponder having receiver means for receiving the interrogation signal and having means operative in response to reception of the interrogation signal to transmit a reply signal comprising a first coded identification signal;

the interrogator having means for receiving said reply signal, checking and retransmitting said reply signal; and

wherein the system comprising the interrogator and transponders includes means for resolving contention between reply signals from different transponders which are received by the interrogator overlapping in time, such contention resolving means including the means within the interrogator for retransmitting said reply signal, and including comparison means within each transponder for comparing a retransmitted reply signal received by the transponder with its respective coded identification signal.

4,691,203

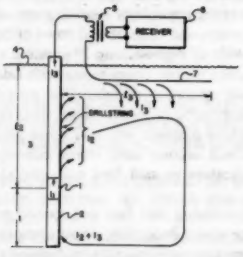
DOWNHOLE TELEMETRY APPARATUS AND METHOD

Llewellyn A. Rubin, 3295 S. Allegheny Ct., Westlake Village, Calif. 91359, and William H. Harrison, 7280 Hyannis Dr., Canoga Park, Calif. 91306

Filed Jul. 1, 1983, Ser. No. 510,298

Int. Cl.[4] G01V *1/40*

U.S. Cl. 340—856 **35 Claims**



1. A downhole drillstring signal transmitting system, comprising:

(a) first and second electrically conductive sleeves adapted to form a section of a drillstring,

(b) means holding said sleeves in axial alignment with their adjacent ends separated from each other by a predetermined insulative gap,

(c) an insulating means separating the sleeve ends across the gap,

(d) an amplifier for amplifying a first frequency electrical signal containing downhole information to be transmitted to the surface, the first signal having a frequency which is suitable for effective propagation through the earth from the downhole location to the surface, the amplifier comprising:

(i) input means for receiving the first signal,

(ii) a first circuit which is responsive to the first signal for generating a second signal having the downhole information content of the first signal, the frequency of the second signal being at least an order of magnitude greater than the frequency of the first signal, greater than the frequency range for effective propagation through the earth from the downhole location,

(iii) means for amplifying the power of the second signal,

(iv) an impedance matching means connected to receive the second signal and to provide impedance matching for the amplfier, and

(v) a second circuit which is responsive to the impedance matched and amplified second signal for generating a third signal having the downhole information content of the second signal and a frequency which is suitable for effective propagation through the earth from the downhole location, and

(e) means for applying the third signal across the sleeves for transmission to the surface.

4,691,204

RADAR APPARATUS

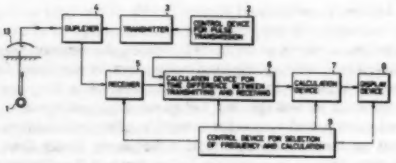
Kazuo Hiramoto, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 31, 1984, Ser. No. 687,862

Claims priority, application Japan, Dec. 29, 1983, 58-247689

Int. Cl.[4] G01S *7/28*

U.S. Cl. 342—22 **5 Claims**



1. In a radar apparatus for detecting a distance from an emitter of the radar apparatus to an underground object to be detected comprising a control device which outputs a timing pulse for controlling the timing of transmitting a detecting pulse used for detecting a buried object in the ground, a transmitter which transmits said detecting pulse from said control device to said buried object through an antenna, a receiver for receiving an echo signal reflected back from said buried object, and a display device for displaying said echo signal received from said receiver, the improvement comprising a calculation device for calculating time differences between said timing pulse from said control device and the time of receipt of signals of two or more different frequencies from said receiver to produce time difference signals, a calculation device for calculating said distance by solution of simultaneous equations based on the equation

$$\sqrt{2d} = \frac{1}{\sqrt{\epsilon\mu\left(\sqrt{1+\left(\frac{\sigma}{\omega_i\epsilon}\right)^2}+1\right)}}\,t_i$$

where

d=distance from said radar apparatus to said underground object to be detected

ϵ=electric permittivity of the medium of the ground

μ=magnetic permeability of the medium of the ground

σ=electric conductivity of the medium of the ground

ω_i=angular frequencies of electromagnetic waves received by said receiver (5)

t_i=delay time from transmition of pulse from said radar apparatus to reception thereof reflected from said underground object

i=1, 2 and 3 corresponding to said different frequencies

relating to the speed of propagation of an electromagnetic wave for said different frequencies and said time differences, and a control device which controls said calculation device to start the calculation of said distance.

4,691,205

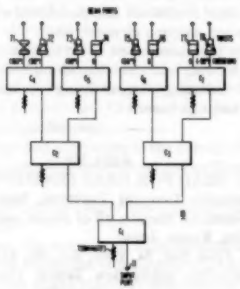
BEAM FORMING NETWORK FOR CIRCULARLY POLARIZED SHAPED BEAM ANTENNA SYSTEM

Charles E. Profera, Jr., Camden, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 6, 1985, Ser. No. 741,873

Int. Cl.⁴ H01Q *21/06, 21/24*

U.S. Cl. 342—365 **10 Claims**



1. A feed network for a circularly polarized shaped beam antenna array having a plurality of antenna elements comprising:

a network of quadrature type couplers coupled to each other in a manner to couple RF signals between a single terminal at one network end and a plurality of terminals at the opposite end such that an RF input signal at said single terminal is power divided according to a desired distribution at said plurality of terminals;

said couplers interconnected without any intervening phase shifters, whereby an input RF signal at said single terminal produces unequal phase shift signals at said plurality of terminals; and

means including twisted waveguides coupled to each of said plurality of terminals for equalizing the phase of said signals from said plurality of terminals.

4,691,206

MICROSTRIP AND CAVITY-BACKED APERTURE ANTENNA

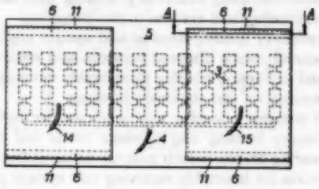
Hugh Shapter, Funtington, and Colin Wood, Havant, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Apr. 5, 1985, Ser. No. 720,405

Claims priority, application United Kingdom, Apr. 11, 1984, 8409339

Int. Cl.⁴ H01Q *1/38, 13/18*

U.S. Cl. 343—700 MS **8 Claims**



1. A microwave antenna comprising a dielectric substrate, carrying on one side thereof a microstrip antenna defined by a plurality of microstrip patches, said antenna being suitable for operation within a first frequency band and carrying on the other side thereof a conductive ground plane, a first microwave feed coupled between the microstrip antenna and the ground plane for conducting microwave signals in the first band, at least one radiation aperture formed in the ground plane for operation within a second frequency band and arranged to communicate with an otherwise closed resonant microwave cavity defined between the ground plane and a conductive enclosure arranged to extend therefrom, and a second microwave feed coupled to conductor means carried on the substrate on a side thereof remote from the ground plane, the conductor means being arranged to extend into the enclosure to feed microwave signals in the second band from the second microwave feed to the resonant microwave cavity.

4,691,207

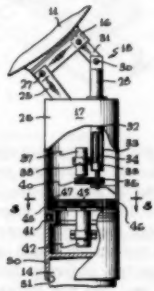
ANTENNA POSITIONING APPARATUS

Anthony A. Timineri, Van Nuys, Calif., assignor to Nissho Iwai American Corporation, Los Angeles, Calif.

Filed Sep. 4, 1984, Ser. No. 646,787

Int. Cl.⁴ H01Q *3/08, 1/12*

U.S. Cl. 343—766 **1 Claim**



1. In a satellite antenna positioning system, the combination which comprises:

an antenna;

an upright post;

movable support means interconnecting said antenna with

said upright post for movably supporting said antenna thereon;

said movable support means including a rotary housing carried on said upright post and being coaxially disposed therewith, and a linkage coupling said antenna to said rotary housing;

a first drive motor means including a gear drive train operably connecting said upright post to said rotary housing for driving said housing about a vertical post axis to position said antenna in azimuth;

a second drive motor means having a reciprocating rod interconnecting said rotary housing with said linkage for positioning said antenna in elevation;

a stationary housing fixed to said upright post;

a bearing means disposed between said stationary housing and said rotary housing for movably mounting said rotary housing on said stationary housing;

said stationary housing having an annular collar at the stationary housing end opposite to its end carrying said bearing means, which annular collar defines a mounting recess for insertably receiving said upright post;

said first drive motor means including a planetary gear mechanism carried in said rotary housing and having a ring gear and driving gears in mesh therewith and a drive motor fixed to said stationary housing and coupled to said driving gears in operative relationship for moving said rotary housing; and

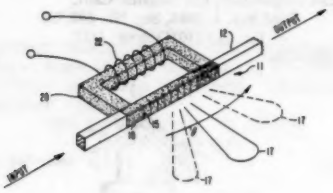
a computer control means operably coupled to said first and second drive motor means for selectively positioning said antenna in azimuth via said first drive motor means and in elevation via said second drive motor means.

4,691,208

FERRITE WAVEGUIDE SCANNING ANTENNA

Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 2, 1984, Ser. No. 640,183
Int. Cl.[4] H01Q *13/00*
U.S. Cl. 343—785 **9 Claims**



1. Phase-scan antenna apparatus comprising:

a rod-shaped length of dielectric waveguide having a major axis extending the length thereof, said waveguide having two non-ferrite dielectric rod-shaped sections fabricated of relatively high dielectric constant material forming the ends of said rod-shaped length of waveguide; and

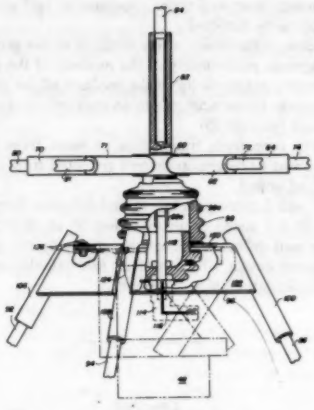
a rod-shaped section of ferrite dielectric disposed between and joining said two non ferrite dielectric sections, said ferrite dielectric section being fabricated of a material having a dielectric constant which closely matches the dielectric constant of said non-ferrite dielectric sections and being equipped with means for permitting electromagnetic wave radiation to be emitted from or received by said ferrite section in a direction generally perpendicular to said major axis of said waveguide.

4,691,209

WIDEBAND ANTENNA

Joseph E. Kershaw, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 19, 1985, Ser. No. 766,462
Int. Cl.[4] H01Q *9/28, 21/00*
U.S. Cl. 343—846 **10 Claims**



1. An antenna comprising:

a coaxial transmission line having an inner conductor and an outer conductor;

a conical antenna element having an apex, said apex being connected to said coaxial connector outer conductor;

a disc-shaped antenna element positioned adjacent said apex and electrically connected to said inner conductor; and

a vertical radiating antenna element electrically connected to said inner conductor and positioned othogonally to said disc-shaped antenna element; and

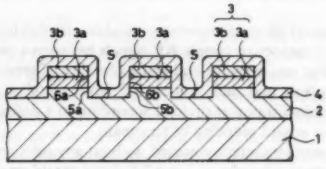
an antenna base comprised of an insulator, said conical antenna element, said disc-shaped antenna element and said vertical radiating element being mechanically connected to said antenna base.

4,691,210

THERMAL HEAD FOR HEAT-SENSITIVE RECORDING

Yasuo Nishiguchi; Tsuyoshi Yasutomi, both of Kokubu, and Ryoichi Shiraishi, Hayato, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Dec. 24, 1985, Ser. No. 812,970
Claims priority, application Japan, Dec. 25, 1984, 59-201055[U]
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **7 Claims**



1. A thermal head comprising a substrate layer, a glaze layer formed on one surface of the substrate layer and a plurality of heat-generating elements formed on the surface of the glaze layer, each heat-generating element comprising a heat-generat-

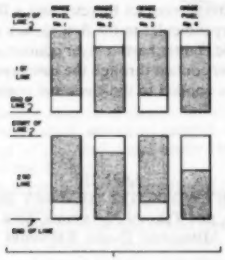
ing resistor and a pair of electrodes connected in series to the heat-generating resistor, wherein the glaze layer is provided with grooves between every two adjacent heat-generating elements, the grooves extending into the glaze layer to a depth of 0.3 to 30 μm.

4,691,211

THERMAL PRINTER

Scott A. Brownstein, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 24, 1986, Ser. No. 843,411
Int. Cl.[4] G01D *15/10*; H04N *1/21*; B41J *3/20*
U.S. Cl. 346—76 PH **1 Claim**



1. Thermal printing apparatus which transfers sublimable dye to form a dye image in a receiver composed of a plurality of lines of dye image pixels, each dye image pixel having N different possible dye density levels with the area of the dye portion of an image pixel being proportional to image pixel density, comprising:

(a) a thermal print head for printing a line of image pixels and including a plurality of groups of heating elements, the heating elements of each group being simultaneously addressable in parallel during at least N time slots which comprise an address cycle;

(b) a carrier including at least one heat transferable sublimable dye and being positionable in relation to the heating elements such that the amount of dye transferred for each image pixel is proportional to the energy provided by an energized heating element;

(c) a receiver disposed in relation to the carrier sheet and the print head for receiving transferred dye to form dye image pixels;

(d) means for moving the carrier and receiver relative to the print head; and

(e) control means for energizing adjacent heating elements during different sequences of time slots of an address cycle to cause adjacent image pixels to be formed in which their dye portions are staggered to form a check-board pattern.

4,691,212

PIEZOELECTRIC OPTICAL BEAM DEFLECTOR

Edward J. Solcz, New York; Gerald A. Domoto, Briarcliff Manor, and Barry M. Wolf, Yorktown Heights, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 14, 1985, Ser. No. 798,091
Int. Cl.[4] G01D *9/42*, *15/14*; H04N *1/21*
U.S. Cl. 346—108 **9 Claims**

1. A piezoelectric laser scanner for use as an optical beam deflector in an electrophotographic printer having a moving photoconductive member, comprising:

a piezoelectric bimorph crystal being mounted on a support member in a cantilevered fashion with one end of the bimorph crystal being free to oscillate along an arc;

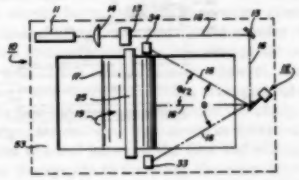
a flexural beam having one end thereof in abutting contact with the free end of the bimorph crystal;

means for attaching the flexural beam to the bimorph crystal, so that their abutting ends are fixed together;

a mirror being bonded to the flexural beam at predetermined distance from the bimorph crystal free end;

means for fixedly mounting the support member to the printer;

means for applying an AC voltage of predetermined frequency to the bimorph crystal to drive said bimorph crystal causing the flexural beam to oscillate at resonance



with a node formed substantially at the center of the mirror, so that the mirror rotates about the node without translation; and

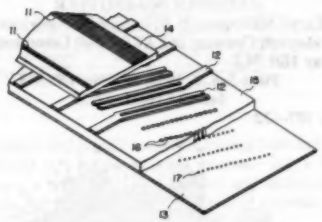
means for direction a laser beam of modulated light to the center of the rotating mirror for deflection thereby across the photoconductive member of said printer, the modulated light containing digital information therein for forming electrostatic latent images on the photoconductive member.

4,691,213

ION GENERATING DEVICE AND METHOD OF MANUFACTURING SAME

Yutaka Inaba, Kawasaki, and Yujiro Ando, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 711,180, Mar. 13, 1985, abandoned. This application Dec. 11, 1986, Ser. No. 941,553
Claims priority, application Japan, Mar. 19, 1984, 59-51034
Int. Cl.[4] G01D *15/06*; H01J *7/24*; C23F *1/02*
U.S. Cl. 346—159 **13 Claims**



1. An ion generating device, comprising:

a plurality of first electrodes extending in a first direction;

a plurality of second electrodes extending in a second direction which is different from said first direction, to constitute a matrix;

a third electrode so disposed that said second electrodes lie between said first electrodes and the third electrode, said third electrode having apertures corresponding to said matrix;

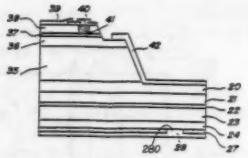
a first dielectric member disposed between said first electrodes and said second electrodes; and

a second dielectric member disposed between said second electrodes and said third electrode, said second dielectric member having a plurality of apertures corresponding to the matrix, which apertures each have a cross-sectional area generally increasing toward said third electrode.

4,691,214
OPTICAL SEMICONDUCTOR APPARATUS

Toshiro Hayakawa, Nara; Takahiro Suyama, Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 23, 1985, Ser. No. 757,975
Claims priority, application Japan, Jul. 31, 1984, 59-163212
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 2 Claims



1. An optoelectronic integrated circuit apparatus comprising:

a planar conductive substrate having a first facet at a first planar surface thereof and a second facet at a second planar surface thereof on the opposite side of said planar substrate from said first planar surface;

an electrical circuit device comprising at least one transistor formed on said substrate at said first facet, said electrical circuit device being isolated from said conductive substrate by a semi-insulating layer formed on said first facet between said substrate and said electrical circuit device;

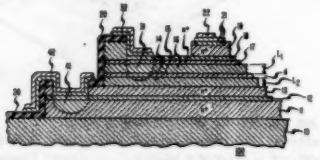
an optical semiconductor device comprising at least one of a semiconductor laser oscillator area and a photo-emitting diode formed on said second facet; and

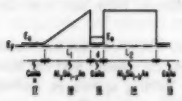
a wiring layer providing an electrical connection between said electrical circuit device and said optical semiconductor device formed on an exterior surface of said semi-insulating layer.

4,691,215
HOT ELECTRON UNIPOLAR TRANSISTOR WITH TWO-DIMENSIONAL DEGENERATE ELECTRON GAS BASE WITH CONTINUOUSLY GRADED COMPOSITION COMPOUND EMITTER

Sergey Luryi, Millington, N.J., assignor to American Telephone and Telegraph Company and AT&T Bell Laboratories, both of Murray Hill, N.J.

Filed Jan. 9, 1985, Ser. No. 689,845
Int. Cl.[4] H01L *29/80*
U.S. Cl. 357—22 9 Claims





1. A unipolar transistor comprising:

(a) a semiconductor base layer having first and second opposing surfaces;

(b) a semiconductor emitter barrier layer contiguous with the first surface of the layer;

(c) a semiconductor collector barrier layer contiguous with the second surface of the base layer;

(d) a separate electrical contact to each of the emitter barrier layer, the base layer, and the collector barrier layer,

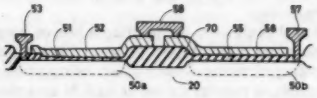
means for forming a degenerate two-dimensional gas of mobile charge carriers in said base layer,

the semiconductor emitter barrier layer being composed of a compound containing an element having a concentration that is continuously graded in a first direction perpendicular to the first surface of the base layer so that the bandgap of the emitter barrier layer is graded in that the bandgap increases in the first direction going toward the first surface of the base layer, whereby during operation, when a forward bias voltage is applied to the emitter barrier layer contact and a negative bias is applied to the collector barrier layer contact, said degenerate two-dimensional gas of mobile charge carriers exists in the base layer extending to the electrical contact thereto, and a flow of electrical current perpendicular to the first surface of the base layer between the emitter barrier layer contact and the collector barrier layer contact through the base layer is controllable by voltages applied to the electrical contacts.

4,691,216
SEMICONDUCTOR MEMORY DEVICE

Yasushi Terada, and Takeshi Nakayama, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1985, Ser. No. 811,881
Claims priority, application Japan, Jan. 18, 1985, 60-7721
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.6 12 Claims



1. A semiconductor device with a programming high-voltage pulse generator in an electrically erasable and programmable read-only semiconductor memory device comprising data storage means including a plurality of memory transistors, each of said memory transistors comprising a semiconductor substrate, a floating gate for storing electric charges and a tunnel oxide film formed between said semiconductor substrate and said floating gate to serve as a path for electric charges, means for programming said data storage means using a programming high-voltage pulse signal, said programming high-voltage pulse generator comprising means for controlling the pulse height of the programming high-voltage pulse, and signal amplifying means for producing said programming high-voltage pulse in response to said controlling means, said pulse height controlling means comprising:

means for generating a reference signal of a predetermined potential,

voltage dividing means including a first capacitance formed of an oxide film having a thickness corresponding to the thickness of said tunnel oxide film and a second capacitance having a predetermined capacitance value, said first capacitance and said second capacitance being connected in series, one end of said first capacitance not connected to said second capacitance receiving the reference signal from said reference signal generating means and an output signal being provided from a junction of said first and second capacitance, and

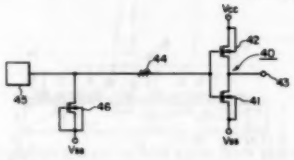
correcting means responsive to the output signal received from said voltage dividing means for providing an output voltage to said signal amplifying means.

4,691,217

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Tatsuaki Ueno, Tachikawa, and Hajime Inoue, Kodaira, both of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Filed Jul. 23, 1985, Ser. No. 758,035
Claims priority, application Japan, Jul. 25, 1984, 59-152996
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.13 25 Claims



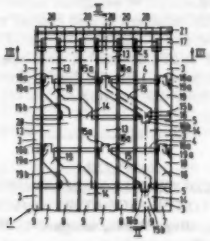
1. A semiconductor integrated circuit device comprising:
an input terminal which serves to receive an input signal from external of the device and apply the signal to the remainder of the device;
a circuit which is composed of first MISFETs connected to said input terminal, a gate electrode of at least one of said first MISFETs being connected to said input terminal; and
a protective circuit which is connected between said input terminal and said circuit and which includes a resistor and a second MISFET, the second MISFET having two semiconductor regions constituting source and drain regions of the second MISFET, and having a gate electrode, said drain region of said second MISFET being directly connected to said input terminal at a position closer thereto than the position at which the input terminal is connected to said resistor, the gate electrode and the source region of the second MISFET being connected to a fixed potential.

4,691,218

CHARGE TRANSFER DEVICE

Arnoldus J. J. Boudewijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 607,903, May 7, 1984, abandoned. This application Jan. 23, 1987, Ser. No. 8,112
Claims priority, application Netherlands, May 13, 1983, 8301715
Int. Cl.[4] H01L *29/78*; G11C *19/28*
U.S. Cl. 357—24 11 Claims



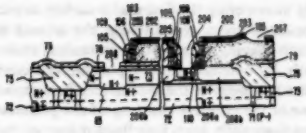
1. A charge transfer device comprising a semiconductor layer and a charge transfer channel associated with the semiconductor layer and having first and second longitudinal sides, a barrier layer on said charge transfer channel, and an electrode system comprising electrodes which are separated by said barrier layer from the charge transfer channel and which extend transversely across the charge transfer channel from one longitudinal side to the other, at least one of said electrodes being a first electrode which is associated with a first storage site present in the charge transfer channel, a second storage site located outside the charge transfer channel which belongs to the semiconductor layer and has an associated second electrode separated by the barrier layer from said second storage site, the first and second storage sites each having a substantially rectangular periphery having a length and a width, which periphery is defined at least in part by the relevant associated first or second electrode, the semiconductor layer comprising a connection channel which extends from the first to the second storage site, a transfer electrode which is separated by the barrier layer from the connection channel, said connection channel being controlled by said transfer electrode, said connection channel joining the first storage site on the first longitudinal side of the charge transfer channel, the transfer electrode being strip-shaped and being arranged substantially parallel to the first longitudinal side beside the charge transfer channel, charge carriers being transferred in operation through the connection channel between the first and second storage sites from one storage site to the other, the connection channel having at an end adjoining the one storage site a width which is smaller than both the length and the width of the one storage site, and the transfer electrode being separated from the first or second electrode associated with the one storage site, characterized in that the strip-shaped transfer electrode has a strip-shaped main part and a projection located at the area of the connection channel, which projection juts out from the strip-shaped main part and extends from said main part at least substantially as far as the periphery of the one storage site.

4,691,219

SELF-ALIGNED POLYSILICON BASE CONTACT STRUCTURE

George R. Goth, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 454,919, Dec. 30, 1982, which is a continuation-in-part of Ser. No. 167,184, Jul. 8, 1980, Pat. No. 4,400,865. This application Mar. 24, 1986, Ser. No. 843,938
Int. Cl.[4] H01L *29/72*
U.S. Cl. 357—34 1 Claim



1. In an integrated circuit transistor having base and emitter regions formed in a semiconductor substrate and a junction therebetween, a polysilicon base contact and dielectric isolation structure for the base-emitter junction at a surface of said substrate, comprising:
a polysilicon base contact on the surface of said substrate overlying a portion of the base region, said base contact having substantially vertical sidewalls near the base-emitter junction and said emitter being self-aligned to said base contact; and
a dielectric isolation region extending upward from the surface of said substrate adjacent said polysilicon base contact, and extending over the base-emitter junction, comprising:
a silicon nitride layer overlying said base-emitter junction and completely covering the vertical sidewalls of said polysilicon base contact,
a polysilicon layer overlying said silicon nitride layer and extending upward from the horizontal surface thereof overlying said base-emitter junction, and
a silicon dioxide layer formed on the surface of said polysilicon layer.

4,691,220

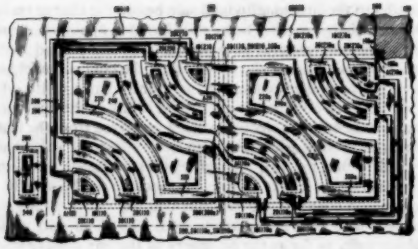
RADIAL HIGH VOLTAGE BIDIRECTIONAL SWITCH STRUCTURE WITH CONCAVO-CONCAVE SHAPED SEMICONDUCTOR REGIONS

Hans W. Becke, Morristown, and Robert K. Smith, New Providence, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 540,159, Oct. 7, 1983, abandoned. This application Dec. 3, 1985, Ser. No. 804,235

Int. Cl.[4] H01L *29/747*

U.S. Cl. 357—39 13 Claims



1. A semiconductor device structure located in a semiconductor body having a first major surface comprising:

(a) a first high conductivity localized region of the body intersecting the first major surface at a first localized area thereof having a perimeter characterized essentially by a concavo-concave portion;

(b) second and third high conductivity localized regions of the body intersecting the first major surface at second and third localized areas, respectively, the second and third areas each having a separate perimeter characterized essentially by convaco-convex portion, the convex portion of the perimeter of the second area being spaced apart from one of the concave portions of the perimeter of the first area essentially by a first fixed distance, the convex portion of the perimeter of the third area being spaced apart from the other of the concave portions of the perimeter of the first area essentially by the first fixed distance; and

(c) fourth and fifth high conductivity localized regions of the body intersecting the first major surface at fourth and fifth localized areas, respectively, the fourth and fifth areas each having a separate perimeter characterized essentially by convex portion, the convex portion of the perimeter of the fourth area being spaced apart from the concave portion of the second area essentially by a second fixed distance, and the convex portion of the perimeter of the fifth area being spaced apart from the concave portion of the third area essentially by the second fixed distance, the sum of the lengths of the convex portions of the perimeters of the fourth and fifth areas being less than the sum of the lengths of the two concave portions of the perimeter of the first area,

the first, second, and third regions all being essentially of one conductivity type, and the fourth and fifth regions both being essentially of conductivity type opposite to the one type and being coupled together by an electrical conductor.

4,691,221

MONOLITHICALLY INTEGRATED BIPOLAR DARLINGTON CIRCUIT

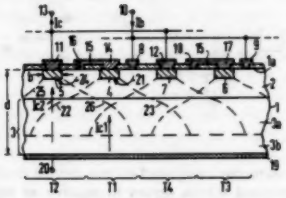
Helmut Herberg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 5, 1985, Ser. No. 762,458

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435571

Int. Cl.[4] H01L *27/02*

U.S. Cl. 357—46 10 Claims



1. A monolithically integrated bipolar Darlington circuit comprising, a driver transistor and an output transistor, formed in a semiconductor body (1) which contains a base layer (2) of a first conductivity type, a collector layer (3) of a second conductivity type below said base layer (2) a driver transistor emitter and an output transistor emitter, of said second conductivity type formed in said base layer (2) and separated a specified distance in a first direction, said emitter of said driver transistor conductively connected to a sub-region of said base layer lying between said driver and output transistors, and whereby said base layer, said emitter of said output transistor and said collector layer are, respectively, provided with a base terminal (10), an emitter terminal (13) and a collector terminal (20), said emitter of said output transistor is composed of a plurality of emitter regions (5, 7) which are provided with emitter contacts (12, 11) connected to said emitter terminal (13); said emitter of said driver transistor is composed of a plurality of emitter regions (4, 6) which are alternately arranged with said emitter regions (5, 7) of said output transistor such that each emitter region (5) of said output transistor lies next to at least one emitter region (4) of said driver transistor, whereby each emitter region of said driver transistor is provided with a conductive coating (14) which contacts said base layer (2) between it and one of said emitter regions (5) of said output transistor which is adjacent to said emitter region of said driver transistor; said base terminal (10) connected to a plurality of base contacts (8, 9) which are mounted on said base layer (2), respectively, adjacent to said emitter regions (4, 6) of said driver transistor; and a thickness (d) of said semiconductor body (1) is greater than one half of said specified distance between adjacent emitter regions (5, 7) of said output transistor between which at least one emitter region (4) of said driver transistor is located.

4,691,222

METHOD TO REDUCE THE HEIGHT OF THE BIRD'S HEAD IN OXIDE ISOLATED PROCESSES

Eugene R. Cox, Puyallup, Wash., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 588,727, Mar. 12, 1984, Pat. No. 4,612,701. This application May 1, 1986, Ser. No. 857,995

Int. Cl.[4] H01L *27/04, 29/34, 29/06*

U.S. Cl. 357—50 2 Claims

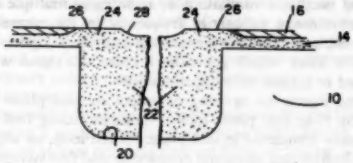
1. A semiconductor structure comprising:

a substrate of semiconductor material;

a plurality of oxide inserts extending into said substrate and having a central portion and a head portion extending above said central portion about the periphery of said

central portion, said head portion having a planar top surface;

an oxide layer on said substrate and the top of said central portion is substantially coplaner with the top of said oxide layer; and



an oxide inhibiting layer on said oxide layer and said planar surface of said head portion is substantially coplanar with the top surface of said oxide inhibiting layer.

4,691,223

SEMICONDUCTOR DEVICE HAVING HIGH BREAKDOWN VOLTAGE

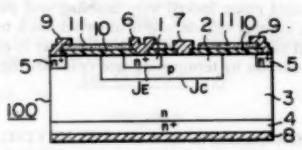
Susumu Murakami, Katsuta; Teruyuki Kagami, Hitachiota; Tsutomu Yatsuo, and Masaaki Takahashi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,464

Claims priority, application Japan, Nov. 9, 1984, 59-234989

Int. Cl.[4] H01L *27/02*

U.S. Cl. 357—51 **27 Claims**



1. A semiconductor device having a high breakdown voltage, comprising:

a semiconductor substrate having between opposite principal surfaces thereof at least three semiconductor layers which are adjacent to each other with alternately different conductivity types to form pn junctions therebetween, one of the outermost layers of said at least three semiconductor layers being on the side of one of said opposite principal surfaces of said semiconductor substrate, the other outermost semiconductor layer being on the side of the other principal surface, at least predetermined ones of said pn junctions having end portions exposed to said one principal surface of said semiconductor substrate;

a first main electrode provided on said one principal surface in low-resistance contact with one outermost semiconductor layer;

a second main electrode provided on said other principal surface in low-resistance contact with said other outermost semiconductor layer;

a control electrode provided on said one principal surface in low-resistance contact with an intermediate layer of said at least three semiconductor layers adjacent to said one outermost semiconductor layer;

an additional electrode provided on said one principal surface in low-resistance contact therewith, said additional electrode having a potential substantially equal to said other outermost semiconductor layer which is in low-resistance contact with said second main electrode;

a surface-passivation insulating film provided on said one principal surface to cover the exposed end portions of said predetermined ones of said pn junctions for passivation thereof; and

a resistive material sheet provided on said surface-passivation insulating film, wherein said resistive material sheet contacts with said first main electrode which is kept in low-resistance contact with said one outermost semiconductor layer, and further wherein said resistive material sheet contacts said additional electrode which has a potential equal to said other outermost semiconductor layer.

4,691,224

PLANAR SEMICONDUCTOR DEVICE WITH DUAL CONDUCTIVITY INSULATING LAYERS OVER GUARD RINGS

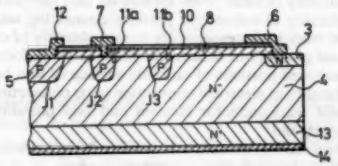
Ikunori Takada, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 543,140, Oct. 18, 1983, abandoned. This application Apr. 22, 1986, Ser. No. 856,434

Claims priority, application Japan, Oct. 25, 1982, 57-188555

Int. Cl.[4] H01L *29/40*

U.S. Cl. 357—53 **10 Claims**



1. A planar semiconductor device comprising:

a main p-n junction formed in a substrate of a first electrically conductive type;

channel stop of said first electrically conductive type formed in said substrate;

guard means disposed in a first region, which is disposed between said main p-n junction and said channel stop, and being at least partially covered with an insulation layer, said insulating layer extending over substantially the entirety of said first region, said guard means minimizing an electric potential difference that may exist between a side of said insulating layer confronting said substrate and a side of said insulating layer opposite to said side confronting said substrate throughout said first region;

said guard means including,

a guard ring consisting essentially of a guard ring region composed of a second electrically conductive type extending to the surface of said substrate so as to be in contact with said insulating layer,

said insulating layer having an opening above a portion of said guard ring, and

an electrode electrically connected to said guard ring through said opening and at least partially covering said insulating layer, said electrode being otherwise electrically isolated, said electrode being provided such that it does not extend outside the said guard ring region in a direction away from said main p-n junction

and wherein said insulating layer comprises two or more layers wherein the upper layer is more electrically conductive than the lower layer which has a surface disposed on said substrate.

4,691,225

SEMICONDUCTOR DEVICE AND A METHOD OF PRODUCING THE SAME

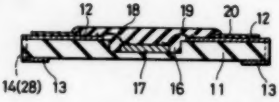
Gen Murakami, Machida, and Takeshi Gappa, Ohme, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 462,060

Claims priority, application Japan, Feb. 5, 1982, 57-16230; Feb. 5, 1982, 57-16231

Int. Cl.[4] H01L 39/02

U.S. Cl. 357—80 33 Claims



1. A semiconductor device comprising:

a base having a front surface, rear surface and side surface, said side surface extending between the front surface and the rear surface, said side surface being nonplanar and having portions which are indented into the base, said front surface being formed in the shape of a square, and said base being made of a material selected from the group consisting of glass epoxy, glass phenol, tirazine, paper phenol, polyimide sand polyester;

a semiconductor element fastened on said front surface;

a plurality of inner leads formed on said front surface so as to surround said semiconductor element;

a plurality of outer leads formed on said rear surface;

a plurality of connective portions connecting said plurality of inner leads respectively to said plurality of outer leads, said plurality of connective portions being formed on the indented portions of said side surface of said base;

a plurality of electrical connection parts connecting between said semiconductor element and said plurality of inner leads; and

a resin sealing, at least, said semiconductor element and said plurality of electrical connection parts.

4,691,226

COLOR-TELEVISION RECEIVER WITH AT LEAST ONE INTEGRATED CIRCUIT FOR PROCESSING THE DIGITIZED COMPOSITE COLOR SIGNAL

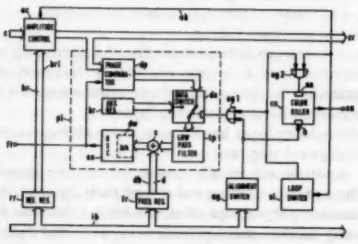
Laurin C. Freyberger, Endingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Oct. 25, 1985, Ser. No. 791,345

Claims priority, application European Pat. Off., Nov. 2, 1984, 8 411 3205.3

Int. Cl.[4] H04N 9/70

U.S. Cl. 358—26 3 Claims



1. A color television receiver having circuits for processing a composite color signal digitized under control of a clock signal, comprising:

first means for receiving a digital chrominance signal from color-television signals and including a burst signal having a burst amplitude and a chrominance subcarrier frequency;

a phase-locked loop including a frequency and phase controllable chrominance subcarrier oscillator;

said phase locked loop being locked in a phase-locked mode to the chrominance subcarrier frequency contained in the burst signal during reception of color-television signals, said oscillator oscillating at an integral multiple of said chrominance subcarrier frequency in the phase-locked mode, said oscillator generating said clock signal;

a color killer which generates a color kill signal which is used to inhibit color reproduction;

second means for opening or unlocking said phase locked loop from said phase-locked mode including first switch means connected in said phase-locked loop, an alignment switch having an output coupled to said first switch means and to a color inhibit input of said color killer, a loop switch having an input coupled to a burst amplitude control circuit and an output coupled to said first switch means and to a color enable input of said color killer;

third means for digitally adjusting the frequency of said oscillator coupled to said phase locked loop;

said first means including said burst amplitude control circuit providing a gain for regulating the burst amplitude to a burst reference value and for providing a control signal when said gain exceeds a predetermined gain;

said second means being responsive to said control signal to open said phase locked loop, causing said oscillator to oscillate at a predetermined alignment frequency, and cause said color killer to inhibit color reproduction by generating said color kill signal;

said burst amplitude control circuit being responsive to the burst signal having a predetermined amplitude relative to said burst reference value to cause said second means to close said phase locked loop enabling said phase-locked mode, causing said oscillator to switch back to the phase locked mode, and causing said color killer to enable color reproduction by terminating said color kill signal.

4,691,227

COLOR IMAGING APPARATUS HAVING A 1:2 FREQUENCY RATIO BETWEEN VIDEO AND REFERENCE SIGNALS FOR HIGH S/N COLOR DEMODULATION

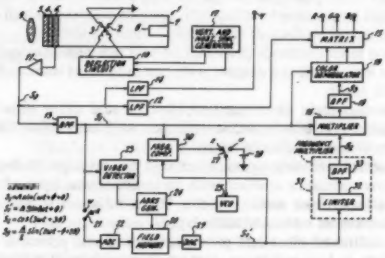
Itsuo Takanashi, Yokohama; Shintaro Nakagaki, Fujisawa; Hiroshi Ichimura, and Takashi Kuriyama, both of Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Oct. 3, 1985, Ser. No. 783,538

Claims priority, application Japan, Oct. 6, 1984, 59-210255; Dec. 3, 1984, 59-255280

Int. Cl.[4] H04N 9/07

U.S. Cl. 358—47 15 Claims



1. Color image pickup apparatus wherein a color image is focused on a photoelectrical conversion target of a color image pickup tube through a color stripe filter and converted to an electrostatic image which is scanned in raster form by an elec-

tron beam under the control of a deflection system in response to horizontal and vertical sync pulses to generate a color-multiplexed video signal from said photoelectrical conversion target, said color stripe filter comprising a plurality of recurrent groups of different color stripes successively arranged at periodic intervals so that said video signal has a frequency inversely proportional to the intervals at which said recurrent groups are arranged, said video signal varying in phase in accordance with relative values of primary color components contained in the color image passing through the strips of each group and varying in amplitude in accordance with intensity of said primary color components, comprising:

a field memory;

reading and writing means for writing into the field memory, during a write-in mode, a reference signal having a duration of at least one field derived from said target when the target is uniformly illuminated by light of a predetermined color passing through said color stripe filter and repeatedly reading the field memory during a read-out mode to generate a constant-amplitude reference video signal having said reference phase;

frequency converting means for converting the frequency of said reference video signal so that said color-multiplexed video signal from said target and the frequency-converted reference video signal have a frequency ratio of 2:1 and an opposite phase relationship therebetween, and

demodulating means for demodulating said colormultiplexed video signal and said frequency-converted reference video signal and deriving a pair of color component signals.

4,691,228

IMAGE READER

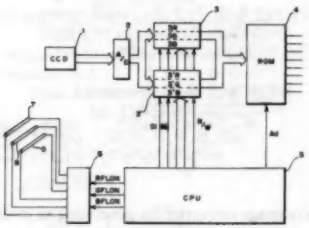
Fumikazu Nagano, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 20, 1985, Ser. No. 746,762

Claims priority, application Japan, Jun. 22, 1984, 59-129888; Aug. 22, 1984, 59-175352

Int. Cl.⁴ H04N *1/46*

U.S. Cl. 358—75 **9 Claims**



1. A color image reader capable of reading a document in one scan of the document in one of three reading modes including a black and white mode, a color mode and a dropped color mode, comprising:

three fluorescent lamps for illuminating a document to be read with incident light, each lamp developing light having its own peak in a red, a green and a blue light zone respectively;

an optical system for obtaining a real image of the document therethrough from a reflection of the incident light by the document during a scan;

a single image sensor being arranged at the position where the real image is focused and producing a sensor signal,

mode selecting means for choosing one of said three reading modes; and

control means for driving the fluorescent lamps with a lighting signal in such a manner that the three fluorescent lamps are turned on and off sequentially and successively during one scan when the color mode is chosen and, the three fluorescent lamps are turned on at the same time during one scan when the black and white mode is chosen, and only two of the fluorescent lamps are lit, at the same time during one scan when the dropped color mode is chosen.

4,691,229

APPARATUS FOR CHECKING COLOR PICTURES ON A COLOR MONITOR

Armin Colditz, Kiel, and Siegfried Klopsch, Probsteierhagen, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

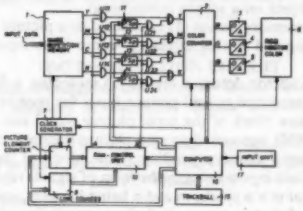
PCT No. PCT/DE84/00185, § 371 Date May 6, 1985, § 102(e) Date May 6, 1985, PCT Pub. No. WO85/01408, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 8, 1984, Ser. No. 734,265

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332791

Int. Cl.⁴ H04N *1/46*; G03F *3/10*

U.S. Cl. 358—76 **4 Claims**

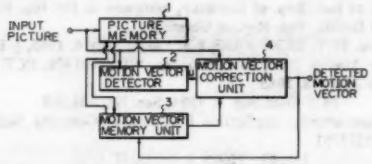


1. Apparatus for displaying a color picture on a color monitor, comprising, an image repetition memory (1) for generating a stationary image on a monitor (6) and containing the printing ink signals Y, M, C, K of the picture to be represented; a color converter (2) which is connected between the image repetition memory (1) and the monitor (6) in order to convert the four printing ink signals Y, M, C, K into three color signals R, G, B for the drive of the monitor (6); a clock generator (7) for generating read signals for the image repetition memory (1) and signals for the synchronization of the image repetition memory, color converter and monitor; color memories (11–14) into which freely selectable ink colors can be input as reference colors, whereby the color memories (11–14) and the outputs of the image repetition memory (1) are connected via gate circuits (U_{11}–U_{24}) to the input of the color converter (2); a coordinate acquisition device (15) for selecting coordinates on the monitor (6); a picture element counter (8) connected to the clock generator (7) by means of which the image signals within the individual lines are counted; a line counter (9) which is connected to the clock generator (7) and by means of which the lines of every individual image are counted; and comprising a control unit (10) which is connected to a computer (16) by means of which the control unit is loaded to the gate circuits (U_{11}–U_{24}), to the picture element counter (8), to the line counter (9) as well as, via the computer (16), to said coordinate acquisition (15) device for selecting coordinates on a monitor, to the color converter (2) and to an input unit (17), whereby the control unit (10) generates control signals for the gate circuit (U_{11}–U_{24}) from the respective coordinates of the device for coordinate acquisition and the two counters (8, 9), these control signals defined, by switching from the image repetition memory (1) to the color memories (11–14) or, respectively, vice versa, that the reference color input into the color memories (11–14) is switched to the color converter (2) by the gate circuit (U_{11}–U_{24}) instead of the output signals of the image repetition memory (1) in a region around the coordinate respectively called in by said coordinate acquisition device.

4,691,230
MOTION VECTOR DETECTION SYSTEM OF A MOVING OBJECT ON A SCREEN

Masahide Kaneko; Yoshinori Hatori, and Tsutomu Miyasato, all of Kanagawa, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 833,311
Claims priority, application Japan, Mar. 4, 1985, 60-41186
Int. Cl.⁴ H04N *7/18, 7/12*
U.S. Cl. 358—105 **5 Claims**



1. A motion vector detection system for detecting motion of a moving object on a screen comprising:

a picture memory means (1) connected to a picture input for receiving and storing at least a frame of an input picture signal;

a motion vector detector means (2) including a first input (100) connected to said picture input for receiving a current frame block of the input picture signal and a second input (105) connected to said picture memory means for receiving a stored preceding frame block of the picture signal, said inputs being in the form of signals representing blocks of m×n pixels, m and n being integers, said motion vector detector means including means for calculating block differences from said block input signals, and comparator means for outputting a first output of a minimum value of block differences and a second output of the block location that gives said minimum value;

a motion vector memory unit (3) connected to said picture memory means (1) and said motion vector detector means (2) to receive and store calculated motion vector outputs for at most one frame duration; and

a motion vector correction unit (4) connected to said picture input, said motion vector detector means (2) and said motion vector memory unit (3) for comparing inputs therefrom and correcting the motion vector of the current input block obtained from said motion vector detector means and providing an an output a corrected detected motion vector;

said comparison being made by calculating block differences of adjacent blocks using previous detected motion vectors stored in said motion vector memory unit (3) and the motion vector output of said motion vector detector means (2), and said corrected detected motion vector being selected from among a previous detected motion vector and the motion vector obtained by said motion vector detector means (2) according to predetermined conditions.

4,691,231
BOTTLE INSPECTION SYSTEM

Tyce Fitzmorris; Eric Espenhahn, both of Lake Park, and Jamie Pereira, North Palm Beach, all of Fla., assignors to Vistech Corporation, Lake Park, Fla.

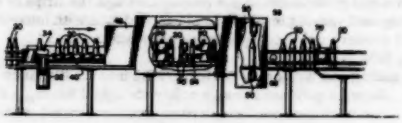
Filed Oct. 1, 1985, Ser. No. 782,432
Int. Cl.⁴ H04N *7/18;* **G01N** *9/04, 21/16;* **B07C** *5/00*
U.S. Cl. 358—106 **20 Claims**

1. An inspection system for hollow transparent and translucent bodies, comprising:

means for delivering the bodies to an inspection zone;

diffuse illumination means disposed on at least one side of the inspection zone;

a plurality of video cameras, each of the cameras being on an opposite side of the inspection zone from the diffuse illumination means, and oriented toward and focused on the inspection zone, the cameras being operable to provide a signal representing shades of light and dark of a matrix of pixels in a video field for each of the cameras, the cameras viewing the illumination means through two walls of the bodies, the fields for successive cameras representing sidewall elevation views angularly spaced around the bodies; and,

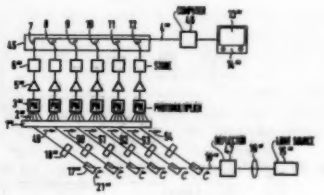


at least one digital processor having means for storing a digital representation of said shades of light and dark, the processor being adapted to count occurrences in at least three predetermined ranges of said shades in predetermined areas on the bodies and to determine the number of occurrences of shades in each of said ranges, and the processor being operable to select bodies meeting acceptable criteria based upon said number of occurrences and based upon a correlation of numbers of occurrences for the predetermined areas.

4,691,232
X-RAY IMAGE CONVERTER

Gottfried Lange, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,433
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3236155
Int. Cl.⁴ H04N *5/32;* **G03G** *5/16*
U.S. Cl. 358—111 **4 Claims**



1. An x-ray image converter for generating an image from an x-ray phosphorescent screen, comprising:

a screen having a stimulable phosphor layer wherein an x-ray image is stored by exposure to x-ray radiation;

a plurality of scanning means for synchronously scanning a corresponding plurality of predetermined partial areas of said screen with lightwave radiation after exposure to x-ray radiation to produce visible image information from each of said partial areas;

a plurality of detector means, each detector means optically coupled to a respective one of said partial areas of said screen for receiving the image information from said screen and for converting said information into a video signal sequence;

storage means for storing therein information related to said video signal sequence; and

a display device for accessing said information stored in said storage device and processing said information to generate a visible picture,

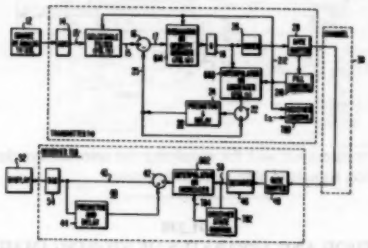
so that due to said plurality of detector means, said visible picture may be generated in high resolution.

4,691,233

RATE BUFFER CONTROL OF DIFFERENCE SIGNAL DECIMATION AND INTERPOLATION FOR ADAPTIVE DIFFERENTIAL PULSE CODE MODULATOR

Alfonse A. Acampora, Staten Island, N.Y., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 30, 1986, Ser. No. 913,692
Int. Cl.[4] H04N *7/137, 7/12*
U.S. Cl. 358—136 **22 Claims**



1. A method for differential pulse code modulation of sampled frame sequential signals, comprising the steps of:

subtracting delayed predicted signals from the frame sequential signals to produce difference signals;

controllably decimating said difference signals to produce decimated difference signals;

interpolating said decimated difference signals to produce an interpolated sample for each decimated sample to form a stream of restored data rate difference signals including at least some interpolated signals;

adding said delayed predicted signals to said restored data rate difference signals to produce current predicted signals; and

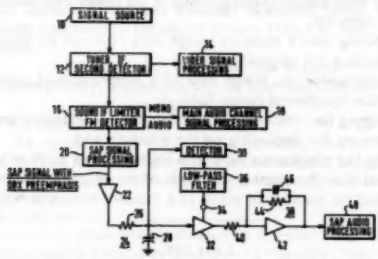
at least delaying said current predicted signals to produce said delayed predicted signals.

4,691,234

NOISE REDUCTION CIRCUIT FOR TELEVISION MULTI-CHANNEL SOUND

David L. Albean, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 31, 1985, Ser. No. 761,216
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—144 **5 Claims**



1. In a television receiver for receiving a selected channel wherein are provided a first audio program signal and a second audio program (SAP) signal containing a high frequency portion and a low frequency portion, said SAP signal being subjected to variable preemphasis for modifying the magnitude of said high frequency portion of said SAP signal without substantially affecting the magnitude of said low frequency portion of said SAP signal such that said high frequency portion is subject to large magnitude compression when the magnitude of said high frequency portion is large and said high frequency portion is subject to small magnitude compression when the magnitude of said high frequency portion is small, said receiver including a detector arrangement for providing first and second outputs corresponding respectively to said first and second audio program signal and including audio signal processing means coupled to said second output for processing said SAP signal which comprises:

first deemphasis network means having an input coupled to said second output for providing an intermediate audio signal representative of said SAP signal and exhibiting a first predetermined amount of deemphasis;

detector means coupled to receive said intermediate audio signal from said first deemphasis network for providing an output representative of the magnitude of said intermediate audio signal substantially throughout its entire frequency range;

controllable gain amplifier means having a gain control input coupled to said detector means and having a signal input coupled to said first deemphasis network; and

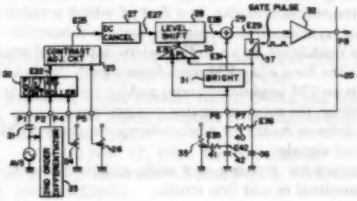
filter means for imparting a second predetermined amount of de-emphasis to the output of said amplifier.

4,691,235

DC RESTORATION CIRCUIT

Isamu Okui, Kumagaya, and Tetsurou Onda, Fukaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 11, 1985, Ser. No. 807,581
Claims priority, application Japan, Dec. 12, 1984, 59-262203
Int. Cl.[4] H04N *5/18*
U.S. Cl. 358—172 **12 Claims**



1. A DC restoration circuit comprising:

gate circuit means, response to a first signal having a pedestal level specific potential portion and responsive to a gate signal, for detecting the specific potential portion of said first signal when said gate signal is applied thereto, and providing a second signal corresponding to the detected specific potential portion;

potential clamp means, coupled to said gate circuit means, for clamping the potential of said second signal to provide a clamped potential;

potential source means for providing a level adjusting potential;

detector means, coupled to said potential clamp means and to said potential source means, for detecting a potential difference between said clamped potential and said level adjusting potential, and providing a third signal corresponding to said potential difference;

circuit means, coupled to said detector means and responsive to a first input signal corresponding to said first signal, for mixing said third signal with said input signal, and providing an output signal which contains a signal component corresponding to said specific potential portion, a DC level of this signal component being a function of said level adjusting potential; and

signal application means, coupled to said circuit means and to said potential source means, for applying to said circuit means a fourth signal corresponding to said level adjusting

potential, so that said output signal also has a component corresponding to said fourth signal.

4,691,236

RECEIVER DEVICE IN A SATELLITE COMMUNICATION SYSTEM

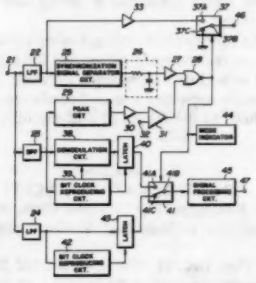
Masayoshi Kanno, Tokyo; Yasuhiro Hideshima, Saitama; Shinobu Tsurumaru, and Ikuo Kanayama, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 30, 1985, Ser. No. 771,229

Claims priority, application Japan, Aug. 31, 1984, 59-182411; Aug. 31, 1984, 59-182414

Int. Cl.[4] H04N *5/262, 5/44*

U.S. Cl. 358—181 **7 Claims**



1. A receiver device in a satellite communication system for transmitting information through an artificial satellite in either of two transmission modes, in a first of which a video signal including synchronization signals and a subcarrier signal which is modulated by an audio and/or data signal are transmitted in the form of an FM modulated signal, and in a second of which an FM modulated audio and/or data signal is transmitted alone, the receiver device comprising:

demodulation means for demodulating transmitted FM modulated signals;

first means for deriving said audio and/or said data signal transmitted in said first mode;

second means for deriving said audio and/or said data signal transmitted in said second mode;

switching means, associated with said first and second means, for selectively deriving one of the output of said first and second means; and

detector means for detecting said first mode, said detector means producing a detector signal for operating said switching means to derive the output from said first means when said first data transmission mode from said satellite is detected.

4,691,237

IMAGE DATA PROCESSING APPARATUS ADAPTABLE TO OUTPUT DEVICES OF DIFFERENT TYPES

Haruo Shimizu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1984, Ser. No. 629,898

Claims priority, application Japan, Jul. 18, 1983, 58-129443

Int. Cl.[4] H04N *1/00, 1/36, 1/40, 1/04*

U.S. Cl. 358—256 **24 Claims**

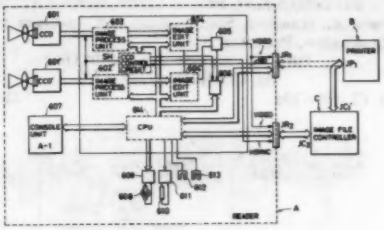
1. An image data processing apparatus comprising:

means for generating image data in syncronism with synchronization signals;

means for outputting internal synchronization signals;

means for transmitting the image data generated by said generating means to an external apparatus; and

means for selecting either the internal synchronization signals from said outputting means or external synchronization signals from the external apparatus in accordance with the external apparatus to which the image data is to



be transmitted, and for supplying the selected synchronization signals to said generating means.

4,691,238

METHOD AND APPARATUS OF STORING IMAGE DATA INTO A MEMORY IN A LAYOUT SCANNER SYSTEM

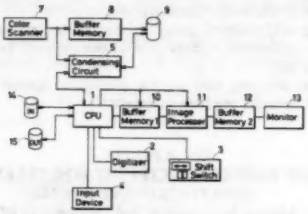
Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jul. 29, 1983, Ser. No. 517,983

Claims priority, application Japan, Oct. 21, 1982, 57-185067; Nov. 17, 1982, 57-202299

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—280 **13 Claims**



1. A method of storing image data into a memory in a layout scanner system operable for storing image data from plural original pictures and then for performing layout work on a monitor with images corresponding to the image data comprising the steps of:

(a) storing into a memory image data obtained by directly scanning the original pictures;

(b) condensing the image data by a predetermined ratio to obtain condensed image data;

(c) storing the condensed image data into a condensed image memory for displaying on the monitor, and

selecting the condensing ratio as a higher one of m/N or n/N provided that the number of pixels of an original pictures is m×n and the number of pixels of a monitor screen is N×N.

4,691,239

DYNAMIC VIDEO SYSTEM AND METHOD

Martin N. Nelson, 50 Willowview Ct., Danville, Calif. 94526, and J. Kirkwood H. Rough, 264 South 14th St., San Jose, Calif. 95112

Filed Dec. 23, 1982, Ser. No. 452,494

Int. Cl.[4] H04N *1/040*

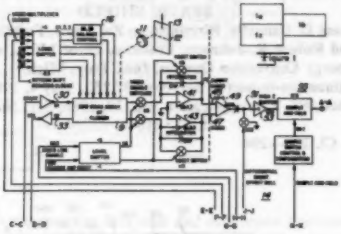
U.S. Cl. 358—282 **18 Claims**

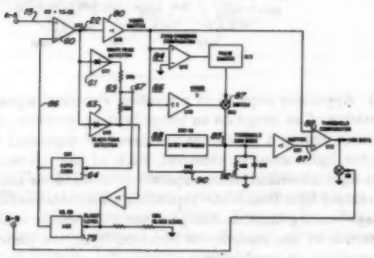
1. Method of processing video signals representative of contrasting marks detected on a background document comprising the steps of:

detecting the extreme limits of amplitude of a plural number of video signals,

adjusting the extreme limits of amplitude of the video signals to amplitudes that are greater than and less than a first selected intermediate auto-zero reference level, and

dynamically detecting with a second dynamic reference level the adjusted video signals of amplitude greater in one





direction than said first selected intermediate auto-zero reference level but less than said video signals as representing detected contrasting marks, and dynamically detecting the adjusted video signals of amplitude greater in the opposite direction than said first selected intermedite auto-zero reference level but less than said video signals as representing detected background of the document.

4,691,240

IMAGE INPUT DEVICE AND A METHOD OF CORRECTING INPUT SIGNALS OF THE SAME

Yasuo Kurusu, Kyoto, and Yoshiaki Morizumi, Shiga, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 20, 1986, Ser. No. 841,467

Claims priority, application Japan, Mar. 30, 1985, 60-67866

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—282 **12 Claims**

1. An image input device for correcting picture signals received in a time-series manner from an original to input said signals in an image processing device, said image input device comprising:

memory means;

a reference plane evenly finished in density;

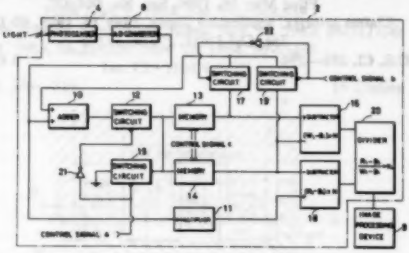
a photosensor formed by an array of a plurality of photoelectric conversion elements;

a lens system for selectively converging the image of either said original or said reference plane on said photoelectric conversion elements of said photosensor;

switching means for selectively switching the object of image formation of said lens system to either said original or said reference plane;

reference data fetch means for performing main scanning of said reference plane at least once by said photosensor in a defocusing manner while switching the object of image formation of said lens system to said reference plane by said switching means to obtain reference data for correction;

means for storing said reference data for correction in said memory means; and



correction means for reading said picture signals from said original by said photosensor in a time-series manner while switching the object of image formation of said lens system by said switching means thereby to correct said picture signals through said reference data for correction stored in said memory means.

4,691,241

METHOD AND SYSTEM FOR COMPENSATING FOR A SHADING PHENOMENON

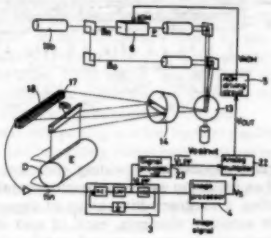
Kunio Tomohisa, Kyoto; Kiyoshi Maeda, Osaka, and Masamichi Cho, Kyoto, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Nov. 15, 1984, Ser. No. 671,984

Claims priority, application Japan, Dec. 6, 1983, 58-231084; Dec. 6, 1983, 58-231083

Int. Cl.⁴ H04N *1/10*

U.S. Cl. 358—293 **12 Claims**



1. A method for campensating for a shading phenomenon comprising the steps of:

(a) obtaining a shading compensation signal by processing an output signal of a low-pass filter employed in a phase lock loop circuit for outputting signals in synchronism with a scanning speed of an input scanning beam polarized by a beam polarizing means; and

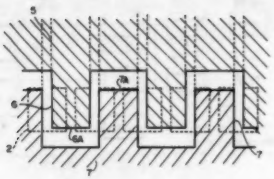
(b) multiplying the shading compensation signal obtained in the step (a) by an image signal obtained by scanning an original with an input scanning beam polarized by the beam polarizing means.

4,691,242

CONTACT TYPE IMAGE SENSOR HAVING MULTIPLE COMMON ELECTRODES TO PROVIDE INCREASED PIXEL DENSITY

Toshiaki Kato, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed May 16, 1986, Ser. No. 864,035
Claims priority, application Japan, May 16, 1985, 60-104374
Int. Cl.[4] H01L 27/14, 31/08
U.S. Cl. 358—294 5 Claims



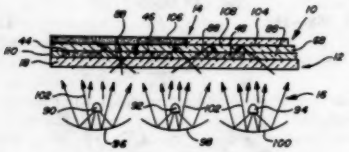
1. An image sensor comprising a layer of a photoelectric material having a pair of opposed major surfaces, a first set comprising a plurality of discrete electrodes spaced apart in a row on one of the pair of major surfaces of said layer, and a second set comprising at least two separate common electrodes on the other of said pair of major surfaces of the layer, each of said common electrodes having portions opposite a different limited portion of each of the discrete electrodes, one of the two sets of electrodes being transparent to pass incident radiation to the layer.

4,691,243

CONTACT-TYPE DOCUMENT SCANNER INCLUDING PROTECTIVE COATING

Vincent D. Cannella, Birmingham; Zvi Yaniv, Farmington Hills, and Robert R. Johnson, Franklin, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 607,153, May 4, 1984, Pat. No. 4,660,095. This application Sep. 29, 1986, Ser. No. 912,476
Int. Cl.[4] H04N 1/024
U.S. Cl. 358—294 26 Claims



1. Apparatus capable of providing electrical signals representative of an image on an image-bearing member, said apparatus including a photosensitive array of deposited semiconductor light sensitive elements, each of said elements being non-light transmissive, non-apertured, continuous and adapted to receive light from a corresponding small area portion of said image-bearing member and generate a detectable signal representative of the intensity of received light; the improvement comprising, in combination:

said array including at least one column of light sensitive elements operatively disposed so as to cover at least a portion of at least one dimension of said image-bearing member; and

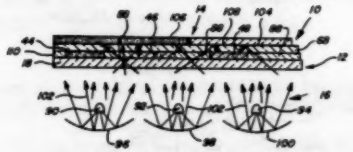
spacing means for closely positioning said light sensitive elements in juxtaposed relation relative to said image-bearing member so as to proximity focus light onto said light sensitive elements from corresponding small area portions of said member, said spacing means including a transparent cover layer overlying said light sensitive elements; said cover layer formed of a material selected from the group consisting essentially of a silicon-carbon alloy, a silicon-nitride alloy, a silicon-oxygen alloy or microcrystalline carbon.

4,691,244

CONTACT-TYPE DOCUMENT SCANNER INCLUDING STATIC SHIELD

Vincent D. Cannella, Birmingham; Zvi Yaniv, Farmington Hills, and Robert R. Johnson, Franklin, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 607,153, May 4, 1984, Pat. No. 4,660,095. This application Sep. 29, 1986, Ser. No. 912,477
Int. Cl.[4] H04N 1/024
U.S. Cl. 358—294 27 Claims



1. Apparatus capable of providing electrical signals representative of an image on an image-bearing member, said apparatus including a photosensitive array of deposited semiconductor light sensitive elements, each of said elements being non-light transmissive, non-apertured, continuous and adapted to receive light from a corresponding small area portion of said image-bearing member and generate a detectable signal representative of the intensity of received light; the improvement comprising, in combination:

said array including at least one column of light sensitive elements operatively disposed so as to cover at least a portion of at least one dimension of said image-bearing member;

spacing means for closely positioning said light sensitive elements in juxtaposed relation relative to said image-bearing member so as to proximity focus light onto said light sensitive elements from corresponding small area portions of said member; and static shielding means operatively disposed between said spacing means and said light sensitive elements for preventing the build-up of a large static charge from damaging said elements.

4,691,245

METHOD AND APPARATUS FOR COMBINING TWO COLOR VIDEO SIGNALS

William K. Hickok, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1984, Ser. No. 677,270
Int. Cl.[4] H04N 9/80, 11/06, 5/782
U.S. Cl. 358—310 12 Claims

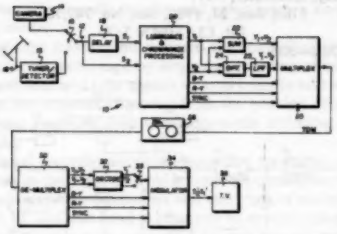
1. A method of color video signal processing comprising:

simultaneously providing first and second video signals which are adjacent in a frame, each of which has unmodulated luminance and chrominance components and has a predetermined time period;

producing a sum luminance signal which is a function of the sum of said luminance components of said first and second signals;

producing a difference luminance signal which is a function of the difference of said luminance components of said first and second signals, the bandwidth of said sum signal being equal to the full bandwidth of said luminance components and being greater than the bandwidth of said difference signal;

producing a chrominance signal which is a function of the chrominance components of said first and second signals; and



selectively compressing said sum and difference luminance and said produced chrominance signal and arranging said compressed signals in a time sequential manner to form a time division multiplex (TDM) signal having a single predetermined time period.

4,691,246

APPARATUS FOR MULTIPLEX RECORDING AND REPRODUCTION OF AUDIO AND VIDEO SIGNALS

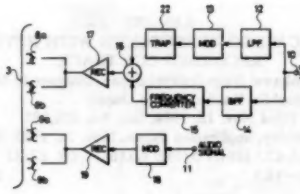
Kuniaki Miura, Naka; Yoshinori Okada, Katsuta; Isao Fukushima, Katsuta, and Susumu Otsuka, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 3, 1984, Ser. No. 677,243

Claims priority, application Japan, Dec. 2, 1983, 58-226878

Int. Cl.⁴ H04N *5/782*

U.S. Cl. 358—310 **4 Claims**



1. A recording apparatus suitable for a magnetic recording-/reproduction apparatus for recording and audio signal and a video signal as superimposed signals on the same recording track, said recording apparatus comprising:

means for recording the audio signal in the form of a frequency-modulated signal on a recording tape by means of a first recording head; and

means for recording video signal information by means of a second recording head on the recording track formed by said first recording head, said video signal information consisting of a frequency-modulated luminance signal and a carrier color signal frequency-converted to a frequency band lower than the frequency band of said frequency-modulated luminance signal, including means for causing the frequency characteristics of the recording current of said frequency-modulated luminance signal to be substantially constant between the carrier frequency corresponding to the sync leading edge portion and the carrier frequency corresponding to the white peak in said frequency-modulated luminance signal.

4,691,247

VIDEO SIGNAL RECORDING/REPRODUCING APPARATUS

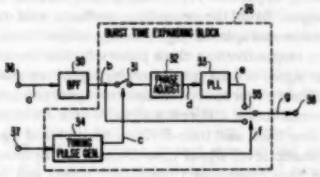
Masahiro Honjo, Neyagawa, and Akio Hashima, Tsuzuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 9, 1984, Ser. No. 669,939

Claims priority, application Japan, Nov. 11, 1983, 58-212736; Nov. 14, 1983, 58-214328; Mar. 28, 1984, 59-61458

Int. Cl.⁴ H04N *9/79*

U.S. Cl. 358—319 **16 Claims**



1. In a video signal recording/reproducing apparatus comprising means for separating an input video signal into a luminance signal and a chrominance signal including a color burst signal, a recording luminance signal processing means for frequency-modulating said luminance signal to obtain a frequency-modulating luminance signal, a recording chrominance signal processing means for converting a frequency band of said chrominance signal to a low frequency band to obtain a low-frequency converted chrominance signal including a low-frequency converted color burst signal, a means for mixing said frequency-converted luminance signal and said low-frequency converted chrominance signal to obtain a recordable video signal, a means for recording said recordable video signal on a recording medium and reproducing said recordable video signal from said recording medium to obtain a reproduced recordable video signal, a means for separating said reproduced recordable video signal into a reproduced frequency-modulated luminance signal and a reproduced low-frequency converted chrominance signal including a reproduced low-frequency converted color burst signal, a reproduced luminance signal processing means for frequency-demodulating said reproduced frequency-modulated luminance signal to obtain a reproduced luminance signal, a reproduced chrominance signal processing means for converting said low frequency band of said reproduced low-frequency converted chrominance signal to said frequency band of said chrominance signal to obtain a reproduced chrominance signal including a reproduced color burst signal, and a means for mixing said reproduced luminance signal and said reproduced chrominance signal to obtain a reproduced video signal,

the improvement comprising a color burst expanding means provided in said recording chrominance signal processing means for expanding an original duration of said color burst signal or said low-frequency converted color burst signal to a specific expanded duration.

4,691,248

SYNCHRONIZED SIGNAL SEPARATING CIRCUIT FOR A RECORDING AND REPRODUCING APPARATUS

Naomichi Nishimoto, Tachikawa, Japan, assignor to Victor Company of Japan, Japan

Division of Ser. No. 628,500, Jul. 6, 1984, Pat. No. 4,616,270. This application May 21, 1986, Ser. No. 865,464

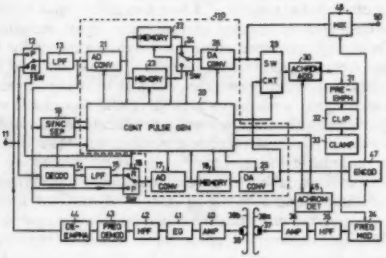
Claims priority, application Japan, Jul. 14, 1983, 58-128222; Jul. 14, 1983, 58-128223

Int. Cl.⁴ H04N *5/08, 5/93*

U.S. Cl. 358—320 **3 Claims**

1. A synchronizing signal separating circuit for a color video signal recording and reproducing apparatus which records a time-division-multiplexed signal on a recording medium, said

time-division-multiplexed signal having a time base compressed luminance signal and one of two kinds of time base compressed color difference signals time-division-multiplexed within one horizontal scanning period and having the two kinds of time base compressed color difference signals time-division-multiplexed in line-sequence with the time base compressed luminance signal, said time base compressed luminance signal and said time base compressed color difference signal being subjected to a time base compression responsive to a clock pulse which is formed based on an output signal of said synchronizing signal separating circuit, said recording and reproducing apparatus reproducing said time-division-multiplexed signal from the recording medium, said reproduced time-division-multiplexed signal being subject to a time base expansion responsive to a clock pulse which is formed based on an output signal of said synchronizing signal separating circuit so as to obtain a reproduced luminance signal and a reproduced line-sequential color difference signal which are returned to an original time base, said time-division-multiplexed signal having an achromatic level signal time-division-multiplexed between said time base compressed luminance signal and one of said time base compressed color difference signals, said achromatic level signal having a level which is approximately in a center of a level range from a pedestal level to a white peak level of said time base compressed luminance signal, having a transmission



period which alternately changes for every one horizontal scanning period and havng a period of two horizontal scanning periods, said synchronizing signal separating circuit comprising:

an input terminal for receiving a composite color video signal to be recorded at the time of a recording, and for receiving said time-division-multiplexed signal at the time of a reproduction;

a horizontal synchronizing signal separating circuit for generating a signal by slicing a horizontal synchronizing signal within said time-division-multiplexed signal received through said input terminal at approximately one-half a peak value of the horizontal synchronizing signal;

pulse generating means for delaying the output signal of said horizontal synchronizing signal separating circuit and for generating a first pulse which exists at a such time position that a leading edge of said achromatic level signal exists within the width of said first pulse; and

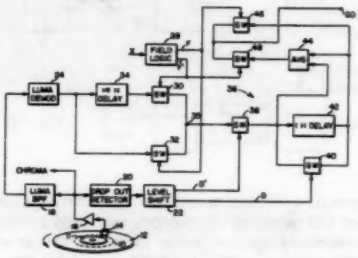
detecting means supplied with said first pulse from said pulse generating means and the output signal of said horizontal synchronizing signal separating circuit for generating a second pulse in phase with a leading edge of said achromatic level signal, said second pulse being produced at the time of the reproduction as a separated horizontal synchronizing signal.

4,691,249

DROPOUT COMPENSATOR AND LUMINANCE AVERAGER WITH "SHARED" DELAY

John J. Acello, E. Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 24, 1985, Ser. No. 747,733
Int. Cl.[4] H04N 5/76
U.S. Cl. 358—336 **5 Claims**



1. A video circuit that compensates for signal dropouts in a video signal representative of a video field and generates an interpolated video signal from adjacent lines of the video field, said circuit comprising:

a one-line delay element having input and output terminals;

an input switch through which the video signal is provided to the input terminal of said delay element;

means for opening said input switch and recirculating the delayed video field signal to said input terminal of said delay element when a signal dropout occurs;

means for generating an interpolated line signal from the video field signals at said input and output terminals of said delay element; and

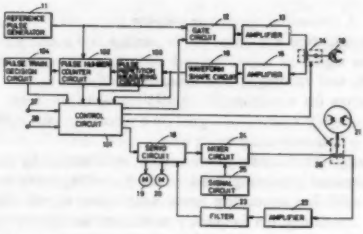
means for generating a video frame signal from the delayed video field signal at the output of said delay element and the interpolated signal from said interpolating means.

4,691,250

MAGNETIC VIDEO REPRODUCER WITH REVERSELY RECORDED CUE TRACK

Katsuhiro Ookawa, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1984, Ser. No. 671,981
Claims priority, application Japan, Nov. 26, 1983, 58-222681
Int. Cl.[4] H04N 5/782; G11B 27/08, 27/32
U.S. Cl. 360—14.1 **13 Claims**



1. A magnetic video reproducer comprising:

a video head for recording video signals on video tracks of a magnetic tape as well as picking up recorded video signals;

video signal recording means for recording video signals and a plurality of pilot signals on said magnetic tape through said video head in a recording mode;

a cue head for recording a cue signal on a cue track provided on said magnetic tape separately from said video tracks as well as for picking up the recorded cue signal;

first tape travel control means for controlling travelling of said magnetic tape based on said pilot signals picked up from said magnetic tape by said video head in a reproducing mode;

second tape travel control means for controlling travelling of said magnetic tape by stopping recording of said video signals and said pilot signals so as to transfer said magnetic tape in a reversed direction from the position of stoppage of said magnetic tape in a stop mode including a pause mode;

cue signal recording control means for recording said cue signal in the form of a pulse train comprising a predetermined number of pulses on said cue track of said magnetic tape by said cue head in response to reverse travelling of said magnetic tape controlled by said second tape travel control means; and

program search control means for transferring said magnetic tape in the forward direction upon releasing of said stop mode, making said cue head pick up said pulse train recorded on said cue track in response to a determination of matching of said pilot signals, and re-starting a recording operation when the number of said reproduced pulses is correlated with the number of said pulses recorded on said cue track during said reverse transfer of said magnetic tape.

4,691,251

MAGNETIC RECORDING AND REPRODUCING APPARATUS IN WHICH RECORDING IS RESTARTED RESPONSIVE TO RECORDED CUE SIGNALS

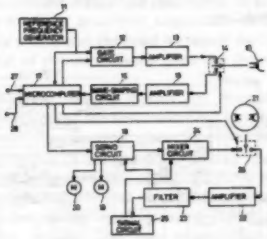
Katsuhiro Ookawa; Toshifumi Fujii, and Yoshihiro Nishida, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,421

Claims priority, application Japan, Nov. 4, 1983, 58-207748

Int. Cl.[4] G11B *27/32, 27/08;* **H04N** *5/782*

U.S. Cl. 360—14.1 **10 Claims**



1. A magnetic recording and reproducing apparatus capable of recording and reproducing a video signal in and from a recording medium (7), said apparatus employing

a rotating head system (21) in which a video head is mounted on the circumference of a rotating drum, and

a helical scanning system (21, FIG. 1) in which said recording medium is adapted to travel slantingly with respect to the direction of rotation of said video head, whereby a plurality of recorded video signal tracks are formed on said recording medium arranged in the direction of travel side by side and slantingly with respect to the direction of travel,

said magnetic recording and reproducing apparatus comprising:

operation mode selecting means (17) for selecting operations of said magnetic recording and reproducing apparatus, said operations including a recording operation of said video signal, a reproducing operation of said video signal, a temporary stop of said recording operation of said video signal, and a cancellation of said temporary stop,

recording medium driving means (19, 20) responsive to a drive control signal for driving said recording medium for forward directional movement thereof, for reverse directional movement thereof, or for stoppage thereof,

forward directional movement driving signal providing means (17, 18) responsive to selection of said recording operation or said reproducing operation of said video signal for providing, as said drive control signal, a forward directional movement driving signal to said recording medium driving means for forward directional movement of said recording medium,

temporary stop signal providing means (17, 18) responsive to selection of said temporary stop of said recording operation for providing, as said drive control signal, a temporary stop signal to said recording medium driving means for bringing said recording medium in forward directional movement of said recording medium to a stop,

reverse directional movement driving signal providing means (17, 18) responsive to said stop of said recording medium for providing, as said drive control signal, a reverse directional movement driving signal to said recording medium driving means for driving said recording medium for reverse directional movement thereof by a predetermined amount,

recording operation disabling means (17, 26) associated with said reverse directional movement driving signal providing means for disabling said recording operation of said video signal for a period of said reverse directional movement of said recording medium,

a cue head (10) provided associated with said recording medium for recording and reproducing a cue signal in and from a cue track formed on said recording medium separate from said video signal tracks,

cue signal providing means (11, 12, 13) associated with said reverse directional movement driving signal providing means for providing a cue signal to said cue head during said reverse directional movement of said recording medium,

forward directional movement restarting signal providing means (17) responsive to said cancellation of said temporary stop for providing, as said drive control signal, a forward directional movement restarting signal to said recording medium driving means for regaining said forward directional movement of said recording medium,

cue signal recording/reproducing control means (17, 14) responsive to said temporary stop of said recording operation for performing a recording operation of said cue signal by said cue head at said cue track for a period of said reverse directional movement of said recording medium and responsive to said cancellation of said temporary stop for performing a reproducing operation of said cue signal by said cue head from said cue track for a certain period of said restarted forward directional movement of said recording medium, and

video signal recording restart control means (17, 26) responsive to reproduction of said cue signal during a period of said restarted forward directional movement of said recording medium for restarting said recording operation of said video signal.

4,691,252

ROTARY MAGNETIC RECORDING-REPRODUCING APPARATUS

Kazuo Okada, and Yoshiaki Nakayama, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Sep. 30, 1985, Ser. No. 782,002

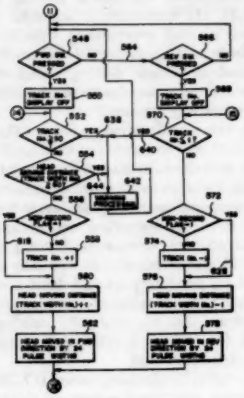
Claims priority, application Japan, Oct. 20, 1984, 59-206706

Int. Cl.[4] G11B *21/02, 21/08*

U.S. Cl. 360—75 **6 Claims**

1. A rotary magnetic recording-reproducing apparatus comprising: a magnetic head for reading signals from a plurality of

tracks each of said tracks formed into a locus in which relative positions of a leading end and a tail end of a recording coincide with each other on a rotary magnetic recording medium; head moving means for transferring said magnetic head onto a selected one of the tracks; and control means for controlling said



head moving means so that the magnetic head is located on the selected track; and

address setting means wherein absolute addresses and relative addresses are simultaneously used to make the addressing from the first track to the final track.

4,691,253

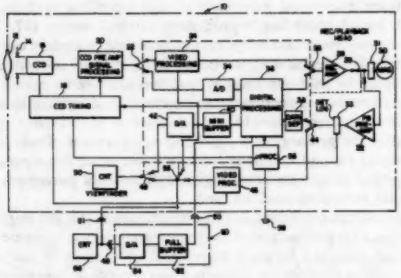
ELECTRONIC IMAGING CAMERA FOR RECORDING EITHER MOVING OR STILL IMAGES

Bruce R. Silver, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 13, 1985, Ser. No. 733,046

Int. Cl.[4] H04N *5/78, 5/76;* **H04J** *5/782*

U.S. Cl. 360—33.1 **9 Claims**



1. An electronic camera apparatus comprising:

photoresponsive means for continuously sensing image defining scene light and providing a continuous electronic information signal in response to the sensed scene light corresponding to the images defined by the scene light;

means for storing electronic signals;

means responsive to said continuous electronic information signal for processing said continuous electronic information signal and thereafter directing said processed continuous electronic information signal to said storage means for storage therein;

an electronic viewfinder;

means for providing from said processed continuous electronic information signal, a first electronic signal to said electronic viewfinder for displaying images on said electronic viewfinder thereby enabling the camera user to frame and compose the scene to be recorded as a continuous moving picture;

means for selectively interrupting said photoresponsive means from continuously sensing said image defining scene light so as to provide a still electronic information signal corresponding to the still image defined by said scene light and displayed on said electronic viewfinder to the camera user at the instant immediately prior to said selective interruption;

means responsive to said still electronic information signal for processing said still electronic information signal and thereafter directing said processed still electronic information signal to said storage means for storage therein; and

selectively responsive means for providing: from said processed and stored continuous electronic information signals a second electronic signal to said electronic viewfinder for displaying continuous images on said electronic viewfinder corresponding to the moving images previously stored or from said processed and stored still electronic information signal a third electronic signal to said electronic viewfinder for displaying a still image on said electronic viewfinder corresponding to the still image defined by said scene light at the instant immediately prior to said selected interruption.

4,691,254

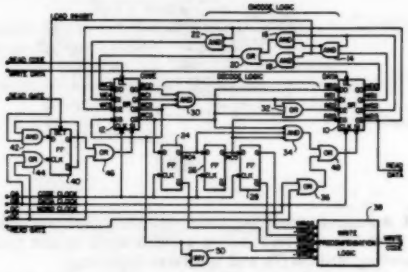
DATA PROCESSING SYSTEM INCLUDING ENCODER, DECODER AND WRITE PRECOMPENSATOR, USING RUN LENGTH LIMITED CODE

Robert L. Cloke, Santa Clara, Calif., assignor to Priam Corporation, San Jose, Calif.

Filed Jun. 24, 1985, Ser. No. 748,157

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—45 **10 Claims**



1. A circuit for processing data signals comprising:

a data shift register for receiving write data bits during a write mode;

a logic network for encoding said data bits in a run length limited code;

a code shift register coupled to said encoding logic network for loading and shifting coded write data bits;

a write precompensation logic circuit coupled to the output of said code shift register for selectively advancing and delaying said coded data bits; and

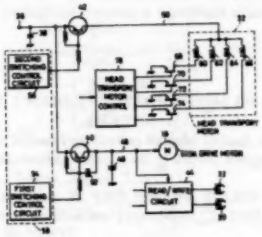
a source of timing signals for synchronizing said code shift register and said data shift register so that only valid data bits are passed to said write precompensation logic circuit.

4,691,255

POWER SAVING CIRCUIT ARRANGEMENT FOR DATA TRANSFER APPARATUS WITH A DISKLIKE RECORD MEDIUM

Yoshiaki Sakai, Higashikurume, and Hiroshi Tsuyuguchi, Tokyo, both of Japan, assignors to Tesc Corporation, Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 699,084
Claims priority, application Japan, Feb. 8, 1984, 59-21301
Int. Cl.[4] G11B *19/02*
U.S. Cl. 360—69 5 Claims



1. A data transfer apparatus for use with a disklike record medium such as a flexible magnetic disk having data storage tracks, comprising:

(a) a disk drive motor for imparting rotation to the record medium;

(b) a transducer head for data transfer with the record medium;

(c) a head transport motor for transporting the transducer head in a predetermined direction relative to the record medium so as to enable the transducer head to access the data storage tracks on the record medium;

(d) direct current power supply means;

(e) a first switching transistor connected between the power supply means and the disk drive motor for the on off control of power delivery from the former to the latter;

(f) a second switching transistor connected between the power supply means and the head transport motor for the on off control of power delivery from the former to the latter;

(g) a first switching control circuit for controlling the switching operation of the first switching transistor;

(h) a second switching control circuit for controlling the switching operation of the second switching transistor;

(i) a voltage regulating capacitor connected between ground and a line connecting the first switching transistor to the disk drive motor, the voltage regulating capacitor having a capacitance greater than the capacitance between ground and a line connecting the second switching transistor to the head transport motor; and

(j) a conduction retarder connected to the first switching transistor for causing a gradual conduction therethrough in response to an output from the first switching control circuit.

4,691,256

INFORMATION REPRODUCING APPARATUS

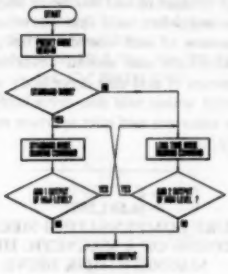
Susumu Kozuki, Tokyo; Hiroyuki Takimoto, Kanagawa; Hiroo Edakubo, Tokyo, and Nobutoshi Takayama, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 563,663, Dec. 20, 1983, Pat. No. 4,594,618.
This application Apr. 28, 1986, Ser. No. 856,708
Claims priority, application Japan, Dec. 24, 1982, 57-230445; Feb. 2, 1983, 58-15581
Int. Cl.[4] G11B *15/52*
U.S. Cl. 360—73 11 Claims

1. A reproducing apparatus for reproducing information signals from recording tracks formed on a tape-shaped recording medium, comprising:

(a) transporting means for selectively transporting said tape-shaped recording medium at one of at least two different running speeds for the purpose of reproducing said information signals;

(b) reproducing means for reproducing said information signals recorded on said recording tracks of said tape-shaped recording medium as it is transported by said transporting means, said reproducing means having at least one rotating head;



(c) first information forming means for forming a first information indicating a distance and a direction of the position of said rotating head relative to said recording tracks by using output signals of said rotating head;

(d) second information forming means for forming a second information indicating a varying period of said first information; and

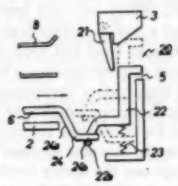
(e) discriminating means for discriminating whether or not the running speed of said transporting means is coincident with the recording speed of said information signals based on the varying period indicated by said second information.

4,691,257

DUST PROTECTION APPARATUS FOR A MAGNETIC DISC DRIVE

Katsuhiko Taguchi, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Japan

Filed Aug. 19, 1985, Ser. No. 767,081
Claims priority, application Japan, Aug. 28, 1984, 59-130022[U]
Int. Cl.[4] G11B *5/012, 5/016*
U.S. Cl. 360—97 20 Claims



1. In a disc drive, a system for preventing the introduction of dust into the interior of said disc drive, comprising:

a disc drive body;

means defining an inlet aperture within a sidewall of said disc drive body through which a disc may be inserted and ejected;

a first cover for covering and uncovering said inlet aperture means of said disc drive body;

means movably mounting said first cover upon said disc drive body between a first position at which said first cover covers said inlet aperture means in the absence of said disc being disposed within said disc drive body, and a second position at which said first cover uncovers said inlet aperture means of said disc drive body when said disc is fully inserted within said disc drive body;

a second cover for covering and uncovering said inlet aperture means of said disc drive body; and

means movably mounting said second cover upon said disc drive body between a first position at which said second cover uncovers said inlet aperture means of said disc drive body in the absence of said disc being disposed within said disc body and when said first cover covers said inlet aperture means of said disc drive body, and a second position at which said second cover covers said inlet aperture means of said disc drive body when said disc is fully inserted within said disc drive body and when said first cover uncovers said inlet aperture means of said disc drive body.

4,691,258

TEMPERATURE COMPENSATING MECHANISM FOR POSITIONING OF A MAGNETIC HEAD OF A MAGNETIC DISK DRIVE

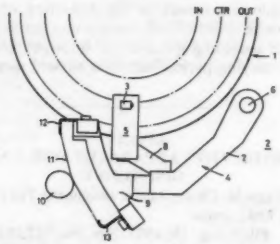
Masashi Kobayashi; Keishi Takahashi, both of Fujisawa, and Kimiya Yoneyama, Yokohama, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1985, Ser. No. 709,942

Claims priority, application Japan, Mar. 30, 1984, 59-61307

Int. Cl.[4] G11B *5/02, 5/012, 5/54, 21/02*

U.S. Cl. 360—97 **3 Claims**



1. A temperature compensating mechanism for positioning a magnetic head of a magnetic disk drive that comprises a movable member supporting said magnetic head, a pulley for driving said movable member, a connecting structure including a band connecting said pulley and two spaced points on said movable member and a pair of springs positioned respectively between each end of said band and each of said two spaced points on said movable member exerting a tensile force on said band, wherein said temperature compensating mechanism is characterized in that the spring coefficient of one half of said connecting structure for connecting the pulley with either one of said two points on the movable member and including one of said pair of springs and the spring coefficient of the other half of the connecting structure including the other of said pair of springs for connecting the pulley with the other of said two spaced points on the movable member are chosen by choosing the respective spring coefficients of said pair of springs so that displacement between the magnetic head and a record track on a magnetic disk caused by temperature change is compensated by the force generated by the connecting structure resulting from the change in length between the two points on the movable member and the connecting structure caused by said temperature change.

4,691,259

MAGNETIC TRANSDUCER HEAD UTILIZING MAGNETORESISTANCE EFFECT

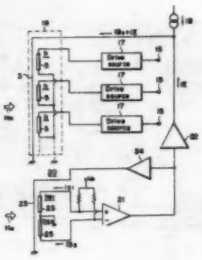
Shigeyoshi Imakoshi; Munekatsu Fukuyama; Hideo Suyama, and Yutaka Souda, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,937

Claims priority, application Japan, Aug. 27, 1984, 59-177847; Oct. 5, 1984, 59-209303

Int. Cl.[4] G11B *5/127, 5/02*

U.S. Cl. 360—113 **17 Claims**



1. A magnetoresistance effect type magnetic head apparatus, comprising:

a magnetic head element including a sensing element having a magnetoresistance effect and a bias conductor means for applying a bias magnetic field to said sensing element for reproducing a recording signal on a magnetic recording medium adjacent the magnetic head element;

detecting means for detecting an external magnetic field which effects said magnetic head element;

bias means for introducing a current through said bias conductor means; and

means connecting an output of the detecting means to said bias means so as to control the current in said bias conductor means and thus control the bias magnetic field.

4,691,260

TUNNEL ERASE MAGNETIC HEAD ASSEMBLY

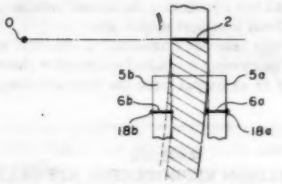
Shuroku Hosaka, Kamakura, and Masaaki Shiga, Fujisawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,318

Claims priority, application Japan, Sep. 16, 1983, 58-170838

Int. Cl.[4] G11B *5/265, 5/024*

U.S. Cl. 360—121 **6 Claims**



1. A magnetic head assembly for use with a magnetic disk having curved data tracks, comprising a recording-reproducing head, having a recording-reproducing gap arranged along a radius of said disk and selectively aligned with one of said data tracks and having two sides perpendicular to said radius, and two erasing heads arranged along said two sides of said recording-reproducing head on opposite sides of said one of said data tracks, each erasing head having an erasing gap, said

erasing gaps having a width parallel to the radius of said record at said recording-reproducing gap, a length extending across said erasing gap perpendicular to said width, and a depth perpendicular to said disk, each erasing gap producing a magnetic field to erase part of said data track, the improvement comprising:

means for making the magnetic field strength of the erasing gap of one of said erasing heads different from the magnetic field strength of the erasing gap of the other of said erasing heads, so that a wider erase path is provided on the radially outward side of the data track, to compensate for the larger off-set distance from the erase head to the data track on the radially outward side due to the curvature of said data path, thus causing a complete erasure on each side.

4,691,261

CHANNEL CHANGING MECHANISM IN A TAPE PLAYER

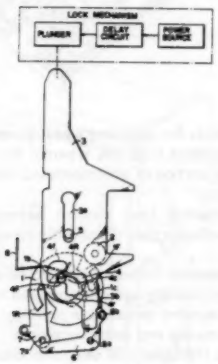
Isao Hasegawa; Kikuo Yoshikawa; Satoshi Takagi, all of Tokyo, and Akira Takahashi, Nagoya, all of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,509

Claims priority, application Japan, Dec. 2, 1983, 58-227029; Dec. 13, 1983, 58-233637

Int. Cl.[4] G11B *15/02, 15/24*

U.S. Cl. 360—137 **2 Claims**



1. A channel changing mechanism in a tape player comprising:

a pinch roller change plate for alternatively bringing a pair of pinch rollers to and away from a pair of capstan shafts;

a power plate operatively linked to said pinch roller change plate to take its forward-mode, reverse-mode and neutral positions;

means for locking said power plate at said forward-mode or reverse-mode position when the source power is supplied to the tape player;

a gear mounted on said power plate and driven by a motor of the tape player;

a power gear mounted on said power plate and having two chipped portions along the geared circumference thereof so as to be intermittently engaged and rotated by said gear;

first engagement means formed in said power plate to engage said power plate with said power gear for establishing reciprocation of said power plate;

resilient means biasing said power gear in its rotatable direction;

a lock link for locking said power gear at an angular position whereat one of said chipped portions is opposed to said motor-driven gear;

said frist engagement means having a release portion to decouple said power plate from said power gear when the power supply is cut off, said power plate having formed a pushing portion for pushing said lock link in a direction to unlock said power gear when said power plate takes its neutral position; and

said lock means being configured to delay its action to lock said power plate by a time corresponding to about a half revolution of said power gear after a power-in to the tape player.

4,691,262

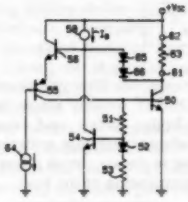
CIRCUIT FOR PROTECTING A POWER TRANSISTOR AGAINST A SHORT-CIRCUITED LOAD

Edward Chalfin, Shrewsbury, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Apr. 3, 1985, Ser. No. 719,618

Int. Cl.[4] H02H *9/02*

U.S. Cl. 361—56 **2 Claims**



1. A circuit comprising:

(a) a bipolar output transistor of one polarity type;

(b) a terminal connected to the collector of said output transistor to which an electrical load may be attached;

(c) a first protective bipolar transistor of said one polarity type;

(d) a DC-bias current source connected to the base of said first transistor for biasing-on said first transistor;

(e) a voltage divider comprised of a diode and one and another resistors connected in series, said voltage divider being connected directly across the base-emitter junction of said output transistor, said diode being connected in the polarity such that a forward current in said diode tends to forward bias said output transistor; and

(f) a second protective transistor of said one polarity type having a base-emitter junction connected across the portion of said voltage divider which is composed of said diode and said another resistor in the direction whereby a forward current through said diode would tend to forward bias said base-emitter junction of said second transistor, and having a collector connected to the base of said first protective transistor; and

(g) a third protective transistor of the opposite polarity type having an emitter connected to the emitter of said first protective transistor and a collector connected to said base of said output transistor so that a signal to be amplified by said output transistor may be applied to the base of said third transistor.

4,691,263

LOW LEAKAGE, SOLID STATE A-C POWER CONTACT

Thomas J. Kenny, and James F. Sutherland, both of Plum Borough, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1985, Ser. No. 809,710

Int. Cl.[4] H02H *3/08*

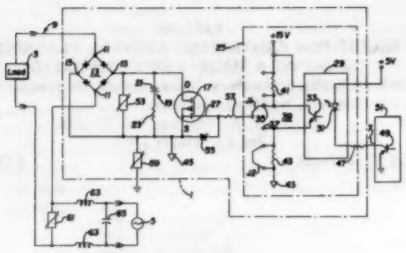
U.S. Cl. 361—58 **6 Claims**

1. A low off current solid state power contact used in switching an a-c power source supplying an a-c load in an a-c

circuit in response to a digital logic signal referenced to earth ground, said power contact comprising:

a rectifier bridge circuit having a pair of a-c terminals connected in series with the a-c source and the load, and a pair of d-c terminals,

a MOSFET having its source and drain terminals connected at the d-c terminals of said rectifier bridge circuit with the digital logic signal connected to its gate electrode, and



a series, resistor capacitor filter circuit connected in parallel with said MOSFET directly across the d-c terminals of said rectifier bridge circuit, said capacitor and resistor values being selected such that, with the MOSFET turned off, the current in the a-c circuit is less than that required to maintain energization of the load.

4,691,264

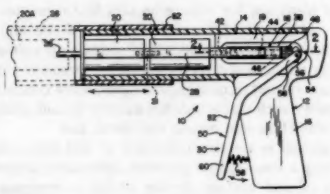
STATIC AMPLIFICATION STUN GUN

Brian E. Schaffhauser, and George Spector, both of 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Sep. 23, 1985, Ser. No. 778,983

Int. Cl.[4] F41B *15/04*

U.S. Cl. 361—232 **5 Claims**



1. A static amplification stun gun comprising in combination:

(a) a non-conductive pistol shaped housing having a hollow barrel and an insulated hand grip;

(b) a piezoelectric crystal unit positional within said barrel;

(c) at least one capacitor postioned within said barrel and operatively connected to said piezoelectric crystal unit;

(d) a probe positioned on an end of said barrel and operatively connected to said capacitor and said piezoelectric crystal unit; and

(e) a trigger means in said hand grip for activating said piezoelectric crystal unit producing a static charge which is then stored in said at least one capacitor until a grounded target, such as an unruly person, can receive said static charge through the air from said probe, wherein said piezoelectric crystal unit comprises:

(f) an insulated cylinder;

(g) a piezoelectric crystal fixed within said container;

(h) two contact members operatively connected to said piezoelectric crystal; and

(i) a piston having an arm, said piston slidable within said cylinder to make contact and compress said piezoelectric crystal with said arm extending outwardly from an end of said cylinder.

4,691,265

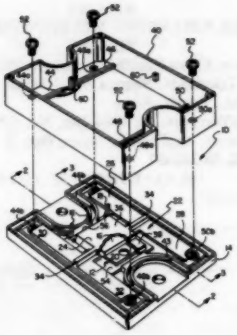
SEMICONDUCTOR MOUNTING ASSEMBLY

John G. Calver, Rochester; Phillip W. Pearce, Pavilion, and Erich Zielinski, Bergen, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 10, 1986, Ser. No. 905,903

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—386 **22 Claims**



1. An assembly for mounting a heat-generating semiconductor to an associated heat sink wherein the semiconductor includes a body portion of predetermined thickness, said assembly comprising:

a heat-dissipating base element having plan dimensions which are larger than the plan dimensions of said semiconductor,

a retainer member formed of a dielectric material and having means for locating and retaining said semiconductor, said retainer member including a plurality of arms connected to said locating and retaining means,

the relative thicknesses of said semiconductor locating and retaining means and said semiconductor and the positioning of said arms with respect thereto being such that the ends of said arms are deflected when said retainer member is connected to said base element to force said semiconductor and said base element into intimate heat transmitting contact, and

means for connecting said base element and said arms of said retainer member.

4,691,266

ELECTRIC DOUBLELAYER CAPACITOR

Arakawa Yoshio, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Mar. 24, 1986, Ser. No. 842,841

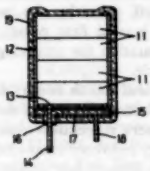
Claims priority, application Japan, Mar. 26, 1985, 60-44640[U]

Int. Cl.[4] H01G *9/00*

U.S. Cl. 361—433 **3 Claims**

1. An electric doublelayer capacitor comprising a cell, a plus terminal plate with a plus terminal rod fixed beneath the cell, an insulating plate, a minus terminal plate with a minus termi-

nal rod fixed beneath the insulating plate, an insulating tube surrounding the cell and a casing covering the top, side and



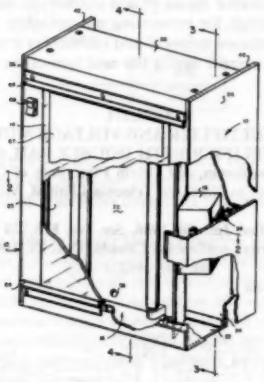
bottom periphery of all said components, characterized in that a shrinkable electroconductive resin film is used as said casing.

4,691,267

FILM ILLUMINATOR

Daniel J. Giesberg, 2347 Malcolm Ave., Los Angeles, Calif. 90064

Filed Jan. 28, 1985, Ser. No. 695,944
Int. Cl.[4] F21V *21/00, 23/02*
U.S. Cl. 362—218 **14 Claims**



1. Apparatus for illuminating film, comprising, in combination:

(a) housing means, including means providing an illuminatable viewing area, the housing means including peripheral heat conductive walls;

(b) lamp means disposed within the housing means for providing illumination to the viewing area;

(c) internal light reflector means for directing light from the lamp area toward the viewing area of the housing means;

(d) ballast means disposed within the housing means and mounted on the reflector means, the ballast means being mounted on the reflector means facing away from the lamp means and operatively connected to the lamp means for controlling voltage applied to the lamp means; and

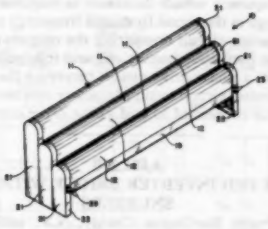
(e) heat sink means comprising an extended heat conductive element within the housing means in thermal contact with both the ballast means and a peripheral wall of the housing means for dissipating heat from the ballast means via the housing means including the peripheral walls, the heat sink means contacting the ballast means in spaced relation to the reflector means.

4,691,268

CAST RESIN LIGHT-EMITTING DISPLAY DEVICE

Walter L. Benson, 17237 7th St. E., Sonoma, Calif. 95476

Filed Oct. 21, 1985, Ser. No. 789,505
Int. Cl.[4] F21S *3/00*
U.S. Cl. 362—223 **17 Claims**



1. A light-emitting display device capable of emitting a deep colorful glow in darkness, comprising:

a thick-walled elongated body of cast light-transmissive plastic resin having an elongated longitudinal tubular chase within the body,

a pigment in the resin,

a neon light tube within the internal tubular chase, as a source of light of the display device,

end closure means on the ends of the elongated body, and

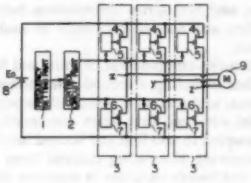
means for illuminating the neon light tube.

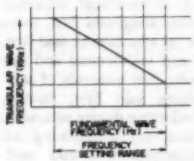
4,691,269

PWM INVERTER APPARATUS

Shigeki Yamane, Fujisawa; Keijiro Mori, Kanagawa, and Kyooya Sakamoto, Fujisawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Matsushita Seiko Co., Ltd., both of Osaka, Japan

PCT No. PCT/JP84/00558, § 371 Date Jun. 26, 1985, § 102(e) Date Jun. 26, 1985, PCT Pub. No. WO85/02505, PCT Pub. Date Jun. 6, 1985
PCT Filed Nov. 22, 1984, Ser. No. 756,987
Claims priority, application Japan, Nov. 28, 1983, 58-223664; Nov. 28, 1983, 58-223665
Int. Cl.[4] H02M *1/12, 7/48*
U.S. Cl. 363—41 **11 Claims**





1. A PWM inverter apparatus comprising a frequency setting circuit providing a signal to set a frequency; a control circuit generating a PWM signal in response to the signal from

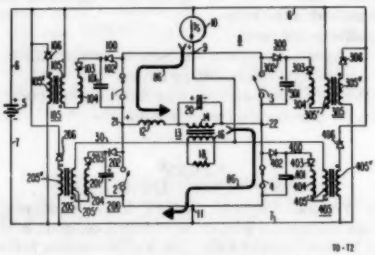
said frequency setting circuit, the PWM signal from said control circuit having a carrier frequency which is varied by the signal from said frequency setting circuit, said control circuit including a fundamental wave oscillating circuit generating a fundamental wave having a frequency which increases in response to an incremental change in the signal from said frequency setting circuit, a triangular wave oscillating circuit having a frequency which decreases in response to the incremental change in the signal from said frequency setting circuit, and a comparing circuit comparing the outputs of said fundamental wave oscillating circuit and said triangular wave oscillating circuit; a phase drive circuit receiving the PWM signal from said control circuit to supply power to a motor; and a DC power source connected to said phase drive circuit.

4,691,270

CURRENT FED INVERTER BRIDGE WITH LOSSLESS SNUBBERS

Duard L. Pruitt, Burlington County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 22, 1986, Ser. No. 887,918
Int. Cl.[4] H02H *7/122*
U.S. Cl. 363—56 **10 Claims**



1. An inverter adapted to be operated from a source of direct voltage, comprising:

a source of direct current adapted to be coupled to first and second terminals of a source of direct voltage for being energized thereby, for producing a substantially constant current between first and second terminals of said source of direct current;

a first series combination of first and second controllable switches including a first intermediate terminal therebetween, said first series combination being coupled across said first and second terminals of said source of direct current;

a second series combination of third and fourth controllable switches including a second intermediate terminal therebetween, said second series combination being coupled in parallel with said first series combination;

a load coupled to said first and second intermediate terminals for receiving alternating current from said first, second, third and fourth switches in response to operation of said switches;

control means coupled to said first, second, third and fourth switches for, in recurrent sequence of four sequential intervals, controlling said first, second, third and fourth switches for (a) maintaining said first and fourth switches conductive and said second and third switches nonconductive during first intervals of said recurrent sequence, (b) maintaining said first, second, third and fourth switches conductive during second intervals of said recurrent sequence, (c) maintaining said first and fourth switches nonconductive and said second and third switches conductive during third intervals of said recurrent sequence, and (d) maintaining said first, second, third and fourth switches conductive during fourth intervals of said recurrent sequence;

first, second, third and fourth snubbers coupled to said first, second, third and fourth switches, respectively, each of said first, second, third and fourth snubbers including the serial combination of a diode and capacitance means, said capacitance means being coupled for being charged in a first polarity by current bypassing the associated switch during its turn-off, whereby the snubber capacitor becomes charged in said first polarity and must be discharged in preparation for receiving current during the next turn-off cycle;

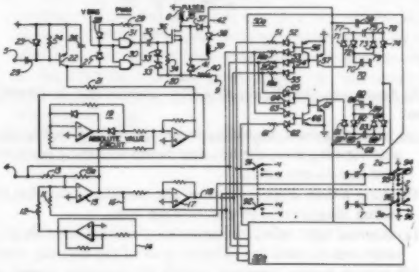
first, second third and fourth energy recovery means coupled to said capacitance means of said first, second, third and fourth snubbers, respectively; said first, second, third and fourth energy recovery means including first, second, third and fourth transformer means, each of said transformer means including a primary and a secondary winding, said secondary windings of each of said transformer means being coupled in series with rectifying means across said first and second terminals of said source of direct voltage, said primary windings of said first, second, third and fourth transformer means each being coupled in series with further rectifying means to form first, second, third and fourth primary circuits, one end of each of said first, second, third and fourth primary circuits being coupled to the junction of said diode and said capacitance means of said first, second, third and fourth snubbers, respectively, the other end of said first and third primary circuits being coupled to said first terminal of said source of direct voltage, the other end of said second and fourth primary circuits being coupled to said first terminal of said source of direct current, for transforming current pulses from said capacitance means of said snubbers to said source of direct voltage for recovering energy while discharging said capacitance means of said snubbers in preparation for receiving current during the next turn-off cycle.

4,691,271

VOLTAGE MULTIPLIER AND VOLTAGE MULTIPLIERS IN AN AMPLIFIER WITH DOUBLE RAIL OUTPUT

Stanley D. Rosenbaum, and Calvin Plett, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 28, 1986, Ser. No. 878,729
Claims priority, application Canada, Oct. 28, 1985, 493989
Int. Cl.[4] H02M *3/02*
U.S. Cl. 363—60 **4 Claims**



1. A voltage multiplier for receiving electrical energy at an input terminal and providing direct current at an output terminal, comprising:

a plurality of n unidirectional current conductive elements being connected in series between ground and the output terminal and being poled in one and the same direction and defining n−1 interconnecting junctions and an n^{th} junction with the output terminal wherein n is an even number of at least four;

a capacitor element being connected between an alternating

current ground and each even numbered ones of said junctions;

a capacitor element being connected between each pair of consecutively odd-numbered ones of said junctions; and

an input capacitor element being connected between the input terminal and the n−1 junction.

4,691,272

INVERSE RECTIFIER

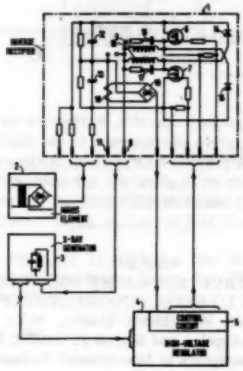
Georg Geus, Wiesbaden, Fed. Rep. of Germany, assignor to Heimann GmbH, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,257

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502492

Int. Cl.⁴ H02M *7/515*; H05G *1/20*

U.S. Cl. 363—98 **2 Claims**



1. An inverse rectifier for use with a high voltage transformer of an x-ray generator comprising:

two switching transistors connected to a common load output;

a constant voltage source having a positive pole and a negative pole, said constant voltage source being connected to said load output through said two switching transistors for alternately connecting said positive and negative poles of said constant voltage source to said load output;

two air-core coils respectively connected between said load output and said switching transistors at respective junctions; and

two diodes cross-connected between said junctions and said constant voltage source, said diodes being respectively polarized so as to block the voltage from said constant voltage source.

4,691,273

SERIES RESONANT CONVERTER WITH PARALLEL RESONANT CIRCUIT

Yutaka Kuwata, Kodaira, Japan, and Louis R. Nerone, Cleveland, Ohio, assignors to Nippon Telegraph & Telephone Corp., Tokyo, Japan and Reliance Comm/Tec Corporation, Chicago, Ill.

Filed Dec. 11, 1986, Ser. No. 940,442

Int. Cl.⁴ H02M *7/538*

U.S. Cl. 363—132 **10 Claims**

1. A controllable converter device for providing electrical current to a load comprising in combination:

(a) a power source;

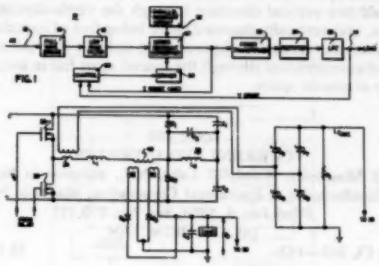
(b) first and second connected switch means;

(c) first and second connected clamp diode means;

(d) a primary winding of a transformer, said winding being interposed between said connected switch means and said connected clamp diode means;

(e) first and second connected capacitor means, said first and second connected switch means, said first and second connected diode clamp means and said first and second connected capacitor means each being connected across said power source;

(f) control means for actuating said first and second connected switch means on and off at an operating frequency



dependent upon said load such that when said switch means are alternately turned on sinusoidal current pulses alternately flow from said source in opposing directions in said primary winding; and

(g) parallel resonant circuit means having a predetermined resonant frequency, said circuit means interposed between said first and second connected diode clamp means and said first and second connected capacitor means to thereby limit said operating frequency to be no lower than said parallel resonant frequency.

4,691,274

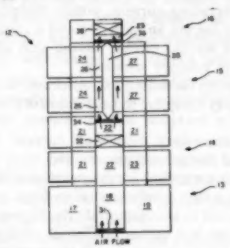
MODULAR ELECTRONIC POWER SUPPLY

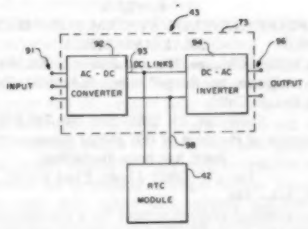
Anthony F. Matouk, Los Altos; David C. Hoffman, Los Gatos, and Donald M. Barrus, San Jose, all of Calif., assignors to Modular Power Corporation, Cupertino, Calif.

Filed Apr. 29, 1986, Ser. No. 857,110

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 363—141 **14 Claims**





1. In an electronic power supply, a framework having front and rear sides and top and bottom sides and having a vertically

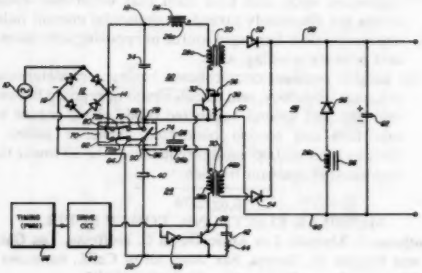
disposed space extending upwardly from the bottom of the framework through the top of the framework, a plurality of vertically spaced power modules disposed in the framework on opposite sides of the vertically disposed space and having vertically disposed heat sinks extending into the vertically disposed space, said heat sinks including a plurality with vertically disposed spaced apart fins extending into said vertically disposed space and means carried by the framework for forcing air in a vertical direction through the vertically disposed space, said vertically disposed space being free of impediments between the vertically disposed heat sinks so that the air can travel uninterrupted through the spaced apart fins in said vertically displaced space.

4,691,275

CURRENT FED INVERTER

Poldi Moscovici, Woodcliff Lake, N.J., assignor to Superior Manufacturing & Instrument Corporation, Maspeth, N.Y.

Filed Jun. 4, 1986, Ser. No. 870,377
Int. Cl.[4] H02M *7/04*
U.S. Cl. 363—143 **18 Claims**



1. A current fed inverter circuit for accommodating two different input voltages from an input source of direct current or rectified alternating current, which comprises:

a first circuit having an inductor and a transformer primary winding; a second circuit having said inductor and said transformer primary winding;

an output circuit including a transformer secondary winding magnetically coupled to said transformer primary winding;

means for alternately modifying current flow in the first circuit and the second circuit; and

operator selector means for connecting said first and second circuits in a first configuration to form a current fed half bridge circuit to accommodate the higher of the two input voltages and in a second, different configuration, to form a current fed push-pull circuit to accommodate the lower of the two input voltages.

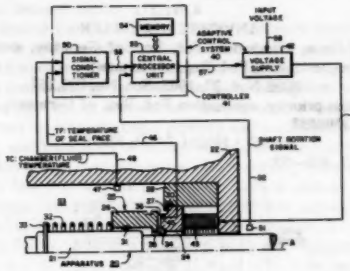
4,691,276

ADAPTIVE CONTROL SYSTEM FOR MECHANICAL SEAL ASSEMBLY

Alan L. Miller, Chicago, Ill., and James L. Kozlowski, Whiting, Ind., assignors to Borg-Warner Industrial Products, Inc., Long Beach, Calif.

Filed Oct. 21, 1985, Ser. No. 789,890
The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.
Int. Cl.[4] G06F *15/46;* F16J *15/34*
U.S. Cl. 364—148 **24 Claims**

1. An adaptive control system for a mechanical seal assembly of the type including first and second seal faces, one of the seal faces being movable toward and away from the other seal face to regulate a gap, and thus adjust a film thickness, between the respective seal faces, actuator means for regulating the displacement of the movable seal face to adjust the film thickness, and sensor means connected to provide a first signal which varies as a function of a given parameter of the seal assembly, said control system being coupled to the sensor means and to the actuator means, for regulating the actuator means as a function of the received first signal, characterized in



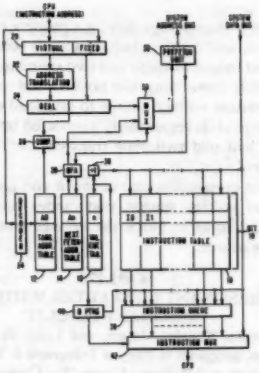
that the control system is operable, in response to identifying the presence of a given phenomenon in the mechanical seal assembly, to identify a reference position of the movable seal face, and thereafter to displace the movable seal face away from the other seal face to establish optimum seal performance.

4,691,277

SMALL INSTRUCTION CACHE USING BRANCH TARGET TABLE TO EFFECT INSTRUCTION PREFETCH

Eric P. Kronstadt, Westchester County, N.Y.; Tushar R. Gheewala, Los Angeles, and Sharad P. Gandhi, Santa Clara, both of Calif., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 24, 1984, Ser. No. 664,275
Int. Cl.[4] G06F *13/14*
U.S. Cl. 364—200 **5 Claims**



1. An instruction memory architecture for a microprocessor comprising:

a branch target table including a target address table, a next fetch address table, a valid entries table and an instruction table;

instruction address register means for storing a target address generated by said microprocessor;

decoder means responsive to said instruction address register means for addressing all entries of an addressed line of said branch target table whenever a branch is taken;

comparator means connected to the outputs of said instruc-

tion register means and said target address table for providing an output indicative of a match between the target address and the accessed target address table entry on said addressed line; and

instruction prefetch means connected to said instruction address register means and said next fetch address table and responsive to the output of said comparator means for fetching the instruction in the accessed next fetch address table if said target address table entry matches the target address, otherwise for fetching the target and subsequent instructions from main memory, said next fetch address table entry for the line being updated so that it always contains the address of the instruction which follows the last valid instruction in the line and said valid entries table being updated so that it always counts the number of valid instructions in the addressed branch target table line.

4,691,278

DATA PROCESSOR EXECUTING MICROPROGRAMS ACCORDING TO A PLURALITY OF SYSTEM ARCHITECTURES

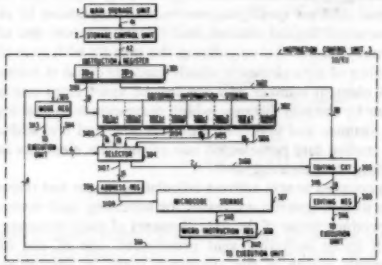
Jun Iwata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,440

Claims priority, application Japan, Apr. 23, 1984, 59-81585; May 25, 1984, 59-106120

Int. Cl.[4] G06F 9/22

U.S. Cl. 364—200 **4 Claims**



1. In a data processor having an execution unit controlled by microprograms, one of said microprograms being read from control storage means and applied to said execution unit for execution thereby in response to a corresponding instruction read from a storage unit, the improvement comprising:

information storage means for storing a plurality of words correlating said instructions to respective microprograms, at least some of said words containing a plurality of instruction codes indicative of respective equivalent functions in a plurality of different system architectures, said words being stored at locations in said information storage means addressed by operation codes of said instructions;

mode information storage means for storing system administrative information for designating one of said system architectures;

selector means for selecting and supplying to said control storage means one of said instruction codes from each word read from said information storage means in response to the system administration information from said mode information storage means.

4,691,279

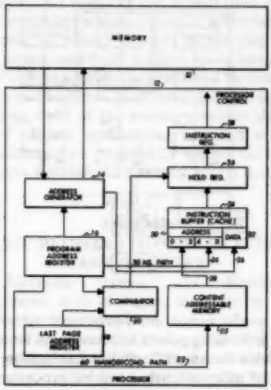
INSTRUCTION BUFFER FOR A DIGITAL DATA PROCESSING SYSTEM

Michael Danilenko, West St. Paul; John T. Rusterholz, Roseville, and Archie E. Lahti, Fridley, all of Minn., assignors to Unisys Corporation, New York, N.Y.

Filed Mar. 2, 1984, Ser. No. 585,708

Int. Cl.[4] G06F 12/08

U.S. Cl. 364—200 **11 Claims**



1. In a data processing system, a instruction buffer comprising:

(a) a program address register means for temporarily storing and providing as an output, a multiple bit address, which address includes, a page address portion and a word address portion;

(b) a content addressable memory connected to said program address register means to receive therefrom and store therein a plurality of page addresses;

(c) an instruction storage buffer means commonly coupled to said program address register means and said content addressable memory to receive a page address from said content addressable memory and a word address from the word address portion of said program address register means;

(d) a previous page address register means coupled to the input of said program address register means to receive and store the address of the previous page sent to the program address register means;

(e) a page address comparator means connected to the output of said program address register means and the output of the previous page address register means to receive and compare the address of the previous page address with the address of the present page address;

(f) a validity indicating and storing means connected to said address comparator means for indicating validity and temporarily storing said indication when said page address comparator means denotes correspondence between the previous page and the present page addresses; and

(g) a single instruction storage means connected to said instruction storage buffer for receiving and temporarily storing an output instruction from said instruction storage buffer means for providing a single output instruction, which is valid only when said validity indicating and storage means indicates page address correspondence by said address comparator means, and is invalid when said validity indicating and storage means indicates a lack of page address correspondence by said address comparator means.

4,691,280

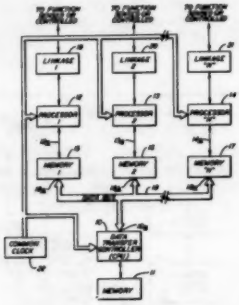
HIGH PERFORMANCE MULTI-PROCESSOR SYSTEM

William S. Bennett, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Continuation of Ser. No. 393,204, Jun. 28, 1982, abandoned. This application Feb. 18, 1986, Ser. No. 812,556

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 **7 Claims**



1. A hign performance multi-processor system having increased data processing power and having an intercommunication system with increased flexibility, comprising:

a plurality of independently operable processor systems;

each of said of said plurality of processor systems includes a data processor means and a private, dual-port memory means;

means in each of said plurality of processor systems connecting its respective data processor means with a first port of its private, dual-port memory means;

data transfer controller means having a separate memory means;

common bus means connecting a second port of each private dual-port memory means to said data transfer controller means and to said separate memory means; and

clock means connected to each one of said plurality of processor systems, including said data transfer controller means for providing timing signals thereto;

said data transfer controller means direct data transfer on a fixed time schedule, which is synchronized with the execution of programs in said plural data processor means by said clock means, said data transfer is transferred synchronously from any one of said private, dual-port memory means to said separate memory and from said separate memory means to another one of said private, dual-port memory means, all data transfer being controlled by said data transfer controller means, so that operation of said plurality of data processor means is independent of such data transfer.

4,691,281

DATA PROCESSING SYSTEM SIMULTANEOUSLY CARRYING OUT ADDRESS TRANSLATION OF A PLURALITY OF LOGICAL ADDRESSES

Toshiyuki Furui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 599,869

Claims priority, application Japan, Apr. 13, 1983, 58-64776; Jul. 22, 1983, 58-132925; Nov. 28, 1983, 58-223731; Nov. 28, 1983, 58-223732

Int. Cl.[4] G06F *12/10*

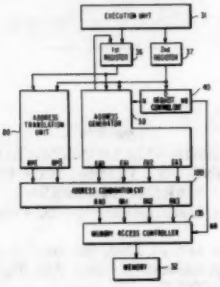
U.S. Cl. 364—200 **5 Claims**

1. A data processing system for use in accessing in each cycle a memory which has a plurality of real addresses located in a real address space and which stores a plurality of sequence of data elements, the data elements of each sequence being stored in the real addresses equidistantly spaced apart from one another in said real address space by a real distance which is representative of an address distance between two adjacent ones of the real addresses for each sequence and which is predetermined for each sequence, said data processing system comprising:

logical address specifying means (**36**) for identifying a preselected one of logical addresses of a logical address space in each cycle that corresponds to a preselected one of the data elements of each sequence;

a distance specifying means (**37**) for identifying the logical distance that corresponds to the real distance between data elements of each sequence in each cycle;

deciding means (**40**) coupled to said distance specifying means and responsive to said logical distance for determining an element number which is the number of data elements to be simultaneously read out for each sequence;



address calculating means (**50, 80, 100, 135**) coupled to said deciding means, said distance specifying means and said logical address specifying means, and responsive to said preselected logical address, said logical distance, and said element number for calculating the specific addresses of a number of data elements which together equal in number said element number and are spaced apart from one another by the real distance which corresponds to said logical distance and which include a preselected real address for storing said preselected one of the data elements as a leading data element; and

means coupled to said address calculating means and responsive to said specific addresses for accessing said memory to produce those of the data elements of each sequence in each cycle including said preselected one of the data elements which in the aggregate equal in number said element number.

4,691,282

16-BIT MICROPROCESSOR SYSTEM

Tsuneo Kinoshita, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 23, 1984, Ser. No. 643,386

Claims priority, application Japan, Aug. 31, 1983, 58-159285

Int. Cl.[4] G06F *9/30*

U.S. Cl. 364—200 **3 Claims**

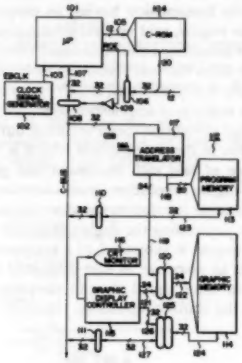
1. A 16-bit microprocessor system comprising:

a memory having a basic address space for storing data and instructions and an expanded address space for storing data, said basic address space including a portion of a logical address space which consists of a plurality of paired segments assigned in units of a task, said portion being assigned to said basic address space in units of a page, each of said paired segments including a first segment for storing said data of said basic address space, and a second segment for storing said instructions of said basic address space, a least significant bit of a first segment number which is assigned to the first segment indicating a

first logic value, a least significant bit of a second segment number which is assigned to the second segment indicating a second logic value, said second segment number being different by one from said first segment number;

a 16-bit microprocessor including memory access data output means for producing memory access data for accessing said memory, said memory access data comprising a status field in which memory control data including first and second specific bits is set, an (n−16)-bit segment field, where n is an integer greater than 16, and a 16-bit address field having first and second fields, said first specific bit indicating an access to one of said basic address space and said expanded address space, said second specific bit designating an operand fetch when equal to said first logic value, and an instruction fetch when equal to said second logic value,

said memory access data output means producing, during an operand fetch executed during execution of a first instruction having an n-bit first logical address, memory access data wherein: (a) said first specific bit of the status field is set to a logic value indicating an access to the expanded address space, (b) said second specific bit of the status field is set to said first logic value, (c) upper (n−16) bits of a first effective address corresponding to the first logical address are set in said segment field, and (d) remaining 16 bits of the first effective address are set in the address field,



said memory access data output means producing, during an operand fetch executed during execution of a second instruction having a 16-bit second logical address, memory access data wherein: (a) said first specific bit of the status field is set at a logic value indicating an access to the basic address space, (b) said second specific bit of the status field is set at said first logic value, (c) a segment number is set in said segment field, (d) a page number in a 16-bit second effective address comprising a page number and displacement within the page is set in the first field of said address field, and the displacement in the second effective address is set in the second field of said address field,

said memory access data output means producing, during an instruction fetch, memory access data wherein: (a) the first specific bit of the status field is set at a logic value indicating an access to the basic address space, (b) the second specific bit of the status field is set at the second logic value, (c) a segment number is set in the segment field, (d) a page number in a 16-bit third effective address comrpising a page number and displacement within the page is set in the first field of the address field, and (e) the displacement in the third effective address is set in the second field of the address field;

register means for holding memory access data output from the memory access data output means of said microprocessor;

a segment/page table, which is retrieved in accordance with data obtained by changing the segment field of the memory access data held by said register means, said changing effected by replacing the least significant bit of said segment field with the second specific bit of said memory access data, and by changing the first field of the address field of said memory access data, said segment/page table being accessed to generate page data; and

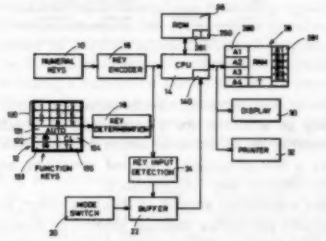
selecting means for selecting one of said basic address space and said expanded address space in accordance with said first specific bit of said memory access data held by said register means, said basic address space being accessed in response to first address data obtained by linking the page data from said segment/page table and said second field of the address field of the memory access data, and said expanded address space being accessed in response to second address data obtained by linking the segment field and address field of said memory access data.

4,691,283

AUTOMATIC REGISTRATION IN AN ELECTRONIC CASH REGISTER

Kumehiko Matsuda, Jyoyo, and Kensaku Komai, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 563,526, Dec. 20, 1983, abandoned.
This application May 28, 1986, Ser. No. 869,835
Claims priority, application Japan, Dec. 27, 1982, 57-231086
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—405 **2 Claims**



1. An electronic cash register for performing registration operations for sales transactions of a plurality of commodities comprising:

keyboard means for entering data identifying particular commodities of a given sales transaction into said register, including,

a plurality of department keys each identifying an individual commodity to be sold,

a plurality of numerical keys each identifying a predetermined group of said individual commodities, and

an automatic registration key for selecting an automatic registration mode of said register;

memory means for storing commodity identity and pricing information, including,

individual memory areas for storing identity and pricing information for each individual commodity to be sold, and

group memory areas for storing information identifying a predetermined group of said individual memory areas; and

means for registering and computing the amount of said given sales transaction in response to either the input of individual commodity data by said department keys, or the input of group commodity data by said numerical keys in conjunction with the activation of said automatic registration key, by retrieving pricing information directly

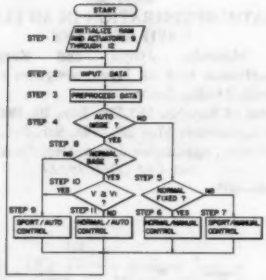
from said individual memory areas, or retrieving pricing information from individual memory areas identified by said group memory areas, respectively.

4,691,284

CONTROL SYSTEM FOR THREE WAY VARIABLE SHOCK ABSORBER DEVICE FOR SUSPENSION WITH HIGHEST SHOCK ABSORBER EFFECTIVENESS NOT SELECTED IN MANUAL MODE

Toshio Izumi; Ryozo Saito; Yoichi Kato, and Hiroshi Miyata, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 14, 1984, Ser. No. 681,586
Claims priority, application Japan, Aug. 18, 1984, 59-172146
Int. Cl.[4] B60G *17/00*
U.S. Cl. 364—424 **10 Claims**



1. For a variable damping effectiveness type shock absorber, comprising an actuator, for a suspension of a vehicle, said shock absorber by selective actuation of said actuator to respectively a first condition, a second condition, and a third condition, wherein said first condition

provides a minimum amount of damping effect, said second condition provides a medium amount of damping effect, and said third condition provides a maximum amount of damping effect: a suspension control system, comprising:

a means for detecting one or more parameters relating to the operational condition of the vehicle and for outputting information signals representative thereof;

a manually controlled selecting means for permitting an operator to manually select between a first manual operational mode, a second manual operational mode, a first auto operational mode and a second auto operational mode; and

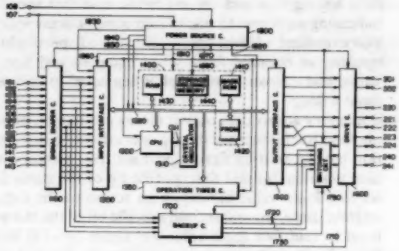
a control means for: when said manually controlled selecting means is selecting said first manual operational mode, actuating said actuator to its said first condition; when said manually controlled selecting means is selecting said second manual operational mode, actuating said actuator to its said second condition; when said manually controlled selecting means is selecting said first auto operational mode, actuating said actuator to one of a set of its said conditions including its said first condition and its said third condition, according to said information signals representing the operational condition of the vehicle outputted by said detecting means; and when said manually controlled selecting means is selecting said second auto operational mode, actuating said actuator to either its said second condition or its said third condition, according to said information signals representing the operational condition of the vehicle outputted by said detecting means.

4,691,285

METHOD AND APPARATUS FOR ALLEVIATING TRANSMISSION SHIFT SHOCKS

Hitoshi Takeda, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 19, 1984, Ser. No. 683,354
Claims priority, application Japan, Dec. 21, 1983, 58-239684
Int. Cl.[4] B60K *41/08*; G06F *15/20*
U.S. Cl. 364—424.1 **10 Claims**



6. An apparatus for alleviating shocks occurring when a transmission shifts from one reduction ratio to another reduction ratio, the transmission having an output shaft and being driven by an engine, said apparatus comprising:

means for detecting a shift command occurring in the transmission from the one reduction ratio to the other reduction ratio and generating a shift command signal;

means for estimating responsive to said shift command signal an engine revolution speed variation during actual shifting operation in the transmission which is caused by the occurrence of said shift command and generating an estimated engine revolution speed variation signal indicative of the engine revolution speed variation estimated; and

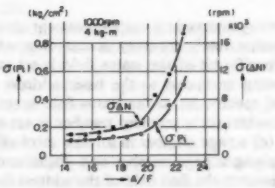
means for controlling the engine such that the output torque of the engine is subjected to a temporary change that is variable in response to said estimated engine revolution speed variation signal so as to alleviate shocks occurring during the shifting operation.

4,691,286

METHOD AND APPARATUS FOR DETECTING COMBUSTION VARIATIONS IN INTERNAL COMBUSTION ENGINE

Hideki Obayashi, Okazaki; Hisasi Kawai, Toyohashi; Toshikazu Ina, Nagoya; Takashi Shigematsu, Susono; Setsuo Tokoro, Susono, and Tokio Kohama, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio; Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, all of, Japan

Filed Jun. 26, 1985, Ser. No. 749,087
Claims priority, application Japan, Jun. 27, 1984, 59-133504
Int. Cl.[4] F02B *3/02*; G06F *15/20*
U.S. Cl. 364—431.04 **8 Claims**



1. A method for detecting combustion variations in an internal combustion engine, comprising the steps of:

detecting at least two engine rotational speeds at predetermined timings for every firing stroke in one cylinder of said engine;

calculating the square of each of the detected engine rotational speeds;

calculating an engine speed variation between two of the squared engine rotational speeds for every firing stroke in one cylinder of said engine; and

performing a process upon the sequence of the calculated engine speed variations, thereby determining an engine combustion state by the processed result.

5. An apparatus for detecting combustion variations in an internal combustion engine, comprising:

means for detecting at least two engine rotational speeds at predetermined timings for every firing stroke in one cylinder of said engine;

means for calculating the square of each of the detected engine rotational speeds;

means for calculating an engine speed variation between two of the squared engine rotational speeds for every firing stroke in one cylinder of said engine; and

means for performing a process upon the sequence of the calculated engine speed variations, thereby determining an engine combustion state by the processed result.

4,691,287

IC DEVICE AND A SYSTEM FOR TESTING THE SAME

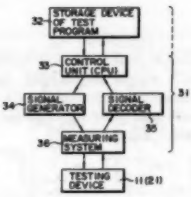
Soichi Suzuki, Yokohama; Mitsuo Aihara, Kamakura, and Mitsuo Fujii, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 25, 1984, Ser. No. 664,764

Claims priority, application Japan, Oct. 31, 1983, 58-202658

Int. Cl.[4] G06F *11/04*; G01R *31/28*

U.S. Cl. 364—490 **9 Claims**



6. A system for testing an IC device comprising:

a testing IC device including a main circuit to be tested, a type-distinguishing data output circuit for outputting IC device type-distinguishing data associated with the type of said main circuit, and a plurality of terminal means selectively coupled to said main circuit and said type-distinguishing data output circuit with a given positional relationship;

IC device type-distinguishing means for producing a signal to read said IC device type-distinguishing data from said type-distinguishing data output circuit of said testing IC device via said plurality of terminal means, and for receiving said IC device type-distinguishing data and determining to which type of IC device as IC device type-distinguishing data belongs;

test program-reading means for receiving the determination results from said IC device-type distinguishing means and for selecting a test program corresponding to the determination results from a plurality of prestored test programs; and

testing means for executing a predetermined test on said testing IC device according to said test program selected by said test program-reading means.

4,691,288

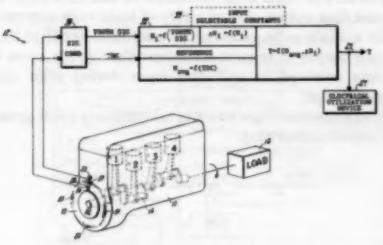
TORQUE SENSOR FOR INTERNAL-COMBUSTION ENGINE

Ira W. Kay, Tolland, and Ronald P. C. Lehrach, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 18, 1985, Ser. No. 713,153

Int. Cl.[4] G01M *15/00*; G06F *15/32*; G01L *3/00*

U.S. Cl. 364—511 **17 Claims**



1. Apparatus for providing a measure of the torgue of an internal-combustion engine having a rotating crankshaft for connection to a load, the crankshaft undergoing acceleration/deceleration sub-cycles associated with respective firing intervals within an engine cycle, comprising:

means for providing electrical signals indicating occurrence of particular angular positions of the crankshaft in an engine cycle;

electronic signal processing means responsive to said signals indicative of a crankshaft angle for providing signals, N_i, indicative of instantaneous sub-cyclic engine speed at each of a plurality of predetermined crankshaft angles in an engine cycle, said plurality of predetermined crankshaft angles including a respective pair of angles for each said firing interval, the respective two crankshaft angles of each said pair being spaced from one another by an angle corresponding with substantially one-half of a firing interval,

for providing in response to said sub-cyclic engine speed signals, N_i, further signals, ΔN_i, representative of the average of the difference between instantaneous engine speeds of the two crank angles of each respective said pair of crankshaft angles within an engine cycle,

for providing signals, N_{avg}, indicative of average engine speed, and

for generating a torque signal, T, as a function of said average engine speed signal, N_{avg}, and said average instantaneous engine speed difference signal, ΔN_i, and

electrical utilization means having said torque signal, T, operatively connected as an input thereto.

4,691,289

STATE MACHINE STANDARD CELL THAT SUPPORTS BOTH A MOORE AND A MEALY IMPLEMENTATION

Robert C. Thaden, Houston, and Mark W. Watts, Hockley, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 23, 1984, Ser. No. 633,367

Int. Cl.[4] G06F *13/00, 3/14*

U.S. Cl. 364—518 **6 Claims**

1. In a video system controller adapted to transfer data between a microprocessor and a display memory in a bit-mapped video display system, said video system controller comprising addressing means for storing a display memory address from said microprocessor and for presenting said display memory address to said display memory, display controller means for synchronizing a video display with said display memory, arbiter logic for choosing whether said microprocessor or said video display shall have access to said display

memory via said video display controller, and memory cycle generator means for generating the memory cycle information required for reading or writing said display memory, the improvement comprising:

a first sequential logic block in said memory cycle generator means comprising:

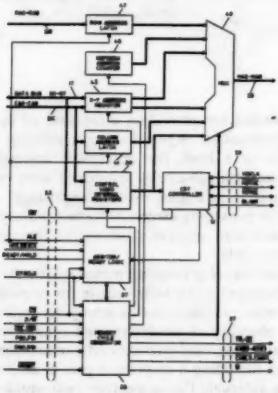
a data input for receiving digital data;

a data output for presenting digital data;

a clock input for receiving clock pulses; and

a plurality of logic cells connected to said data input and said data output, said plurality of logic cells responsive to a clock pulse received by said clock input to cause said output to present data dependent solely upon the data received by said data input during prior clock pulses; and

a second sequential logic block in said memory cycle generator means comprising:



a data input for receiving digital data;

a data output for presenting digital data;

a clock input for receiving clock pulses; and

a plurality of logic cells connected to said data input and said data output, said plurality of logic cells responsive to a clock pulse received by said clock input to cause said output to present data dependent upon the data received by said data input during prior clock pulses;

wherein said logic cells in said first and said second sequential logic blocks comprise substantially the same circuit components which are interconnected dependent upon the desired responsive behavior of said logic cells;

and wherein said memory cycle information is comprised of the outputs of said first and said second sequential logic blocks.

4,691,290

CREEP-COMPENSATED WEIGHING APPARATUS

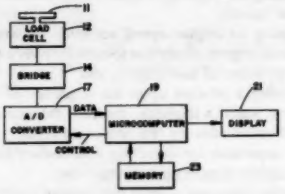
Neil C. Griffen, Westerville, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

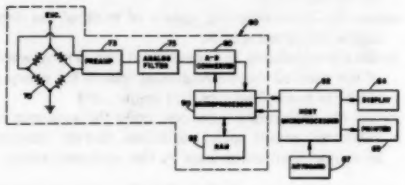
Filed Aug. 6, 1984, Ser. No. 638,272

Int. Cl.[4] G01G *23/14, 19/413*

U.S. Cl. 364—567 **28 Claims**

1. Weighing apparatus compensated for creep comprising a weighing mechanism, means for storing the creep state of said weighing mechanism, means for obtaining a representation of the weight on the weighing mechanism, means for predicting the creep increment resulting from said stored creep state and said weight, means for combining said creep increment with said stored creep state to determine a current creep state, means for combining said current creep state with said weight representation to provide a corrected weight representation,





and means for storing said current creep state in place of said stored creep state.

4,691,291

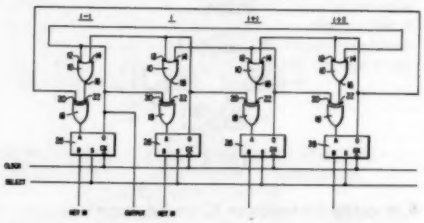
RANDOM SEQUENCE GENERATORS

Stephen Wolfram, Cambridge, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Filed Sep. 23, 1985, Ser. No. 779,121

Int. Cl.[4] G06F *1/02*

U.S. Cl. 364—717 **11 Claims**



1. A random sequence generator, comprising

a plurality of successive stages arranged in a closed loop wherein each of said stages includes

a logic circuit having n inputs and an output, said logic circuit having 2^n addresses for generating a 0 or 1 at its output in accordance with the signal applied to its n inputs;

an input-output circuit having a first input connected to the output of said logic circuit, a second input and an output; and

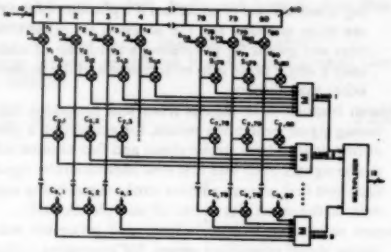
connection means connecting one of the inputs of said logic circuit to the output of the input-output circuit of the same stage, another input of said logic circuit to the output of the input-output circuit of a preceding stage and still another input of said logic circuit to the output of the input-output circuit of a succeeding stage, an output signal having a plurality of sequential random values being generated at the output of each of said input-output circuits in response to an initial key signal applied to the second inputs of said input-output means.

4,691,292

SYSTEM FOR DIGITAL MULTIBAND FILTERING

Joseph H. Rothweiler, Bloomfield, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 13, 1983, Ser. No. 484,526
Int. Cl.[4] G06F 7/38
U.S. Cl. 364—724 6 Claims



1. In a signal processing system including a signal transmitting system in which a signal processed for transmission is separated by a transmit digital filter means into several subbands, the improvement comprising:

means in said transmit digital filter means for generating said subbands including sine and cosine functions, the sine functions for generating every other one of said subbands and the cosine functions for generating the remaining ones of said subbands; and

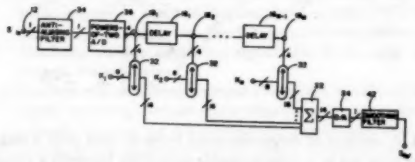
wherein said sine and cosine functions are phased to preserve all components of the transmitted signal.

4,691,293

HIGH FREQUENCY, WIDE RANGE FIR FILTER

Leo W. Conboy, Huntington Beach, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Dec. 28, 1984, Ser. No. 687,088
Int. Cl.[4] G06F 7/38
U.S. Cl. 364—724 5 Claims



1. A digital FIR filter, comprising:

(a) a source of time-spaced analog samples of a signal to be filtered;

(b) encoding means for converting said samples into a digital code representative of signal levels differing from each other by powers of two;

(c) first storage means for storing a predetermined sequence of said digitally encoded signal samples;

(d) second storage means for storing a plurality of predetermined coefficients;

(e) shifting means for multiplying each sample of said sequence by one of said coefficients through shifting the digits of said coefficient by a number of positions determined by said digital code; and

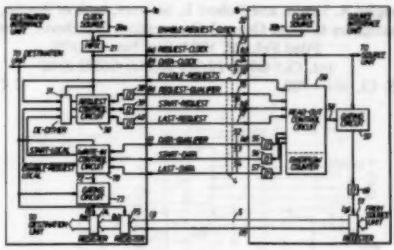
(f) accumulator means for producing a digital value representative of the sum of said multiplications.

4,691,294

CLOCK/DATA SYNCHRONIZATION INTERFACE APPARATUS AND METHOD

Richard J. Humpleman, Stoke-on-Trent, England, assignor to International Computers Limited, London, England

Filed Sep. 17, 1985, Ser. No. 776,823
Claims priority, application United Kingdom, Sep. 21, 1984, 8423968
Int. Cl.[4] G06F 13/00
U.S. Cl. 364—900 6 Claims



2. A data transfer system for transmitting data from a source unit to a destination unit and comprising:

first interface apparatus for the source unit,

second interface apparatus for the destination unit, and

a plurality of signal paths interconnecting the said first interface apparatus and second interface apparatus which plurality of signal paths comprises

a first clock signal path,

a second clock signal path,

a data request signal path,

a path for a signal indicating data transmission, and

a data signal path,

the second interface apparatus for the destination unit comprising

means providing a reference clock signal,

means coupled to the last-mentioned means for transmitting onto the first clock signal path a clock signal derived from the reference clock signal,

means operating under timing control derived from the reference clock signal for outputting a data request signal onto the data request signal path,

means coupled to the path for the signal indicating data transmission and operating under timing control derived from the clock signal received from the second clock signal path for detecting the signal indicating data transmission and arranged in response thereto to output a control signal, and

means coupled to the data signal path and responsive to the said control signal to register data received on the said data signal path under timing control derived from the signal received from the second clock signal path, and

the first interface apparatus for the source unit comprising,

means coupled to the first clock signal path receiving the clock signal transmitting over that path,

means coupled to the last-mentioned means for transmitting over the second clock signal path a clock signal derived from the clock signal received from the first clock signal path,

means coupled to the data request signal path and operating under timing control derived from the clock signal received from the first clock signal path for detecting a data request and outputting a control signal or signals in response thereto,

means responsive to a said control signal from the detecting means for outputting signals indicating data transmission over the path therefor under timing control

derived from the clock signal received from the first clock path, and

means responsive to a said control signal from the detecting means for outputting a data signal over the data signal path under timing control derived from the clock signal received from the first clock signal path.

4,691,295

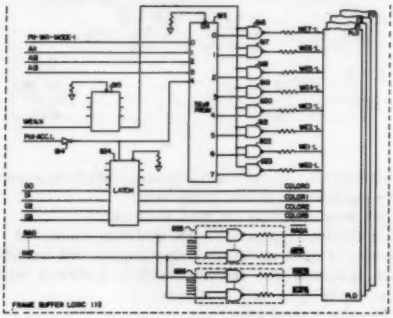
SYSTEM FOR STORING AND RETREIVING DISPLAY INFORMATION IN A PLURALITY OF MEMORY PLANES

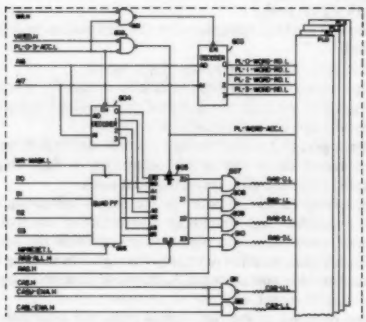
Douglas A. Erwin, and Robert L. Skinner, both of Austin, Tex., assignors to Data General Corporation, Westboro, Mass.

Filed Feb. 28, 1983, Ser. No. 470,698

Int. Cl.[4] G06F *12/00, 3/153;* G09G *1/02*

U.S. Cl. 364—900 **3 Claims**





1. Memory control apparatus for controlling memory access in a display terminal, said display terminal having

a processor;

memory means for storing at least the display image, said memory means containing a plurality of memories, each memory having a plurality of addressable storage locations, said memories being functionally divided into a plurality of planes such that one data bit of each pixel is located in each plane, each of said planes containing a plurality of memories;

bus means for providing at least addresses and data from said memory means;

means for generating timing signals and means for supplying said timing signals to at least said processor, said memory means and said memory control apparatus, said memory control apparatus comprising:

means connected to said bus means and responsive to address selection signals from said processor and said timing signal generating means, for generating row and column addresses for said memories, said row and column address generating means including

means for generating a first pair of addresses if the data from the memory is to be displayed, means for generating a second pair of addresses if a plurality of the planes are to be accessed and the access is for other than display and means for generating a third pair of address if only a single plane is to be accessed and the access is for other than display;

means, responsive to signals from said processor and said timing signal generating means, for generating a plurality of first row address strobe signal and first column address strobe signals, each said first row address strobe signal and each said first column address strobe signal being supplied only to the memories in one of said planes; and

means responsive to signals from said processor and said timing signal generating means, for generating a plurality of second row address strobe signals and second column address signals, each said second row address strobe signal and each said second column address strobe signal being supplied to a portion of the memories in each of said planes.

4,691,296

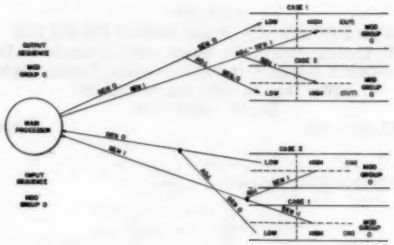
METHOD AND APPARATUS FOR EXCHANGING MULTIPLE DATA BYTES WITH AN I/O MODULE IN A SINGLE SCAN.

Odo J. Struger, Chagrin Falls, Ohio, assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Nov. 16, 1984, Ser. No. 672,457

Int. Cl.[4] G05B *11/01*

U.S. Cl. 364—900 **11 Claims**



1. A method of communicating bytes of data over a single-byte data bus in a programmable controller between a processor and two I/O modules, one of which is an output module, and one of which is an input module, wherein the processor transmits a first write signal and a first enable signal to the output module, wherein the processor transmits a second write signal and a second enable signal to the input module, wherein said first write signal is transmitted to both the input module and the output module, and wherein said second write signal is transmitted to both the input module and the output module, the method comprising:

the output module receiving and responding to said first write signal and said first enable signal from the processor to receive a first byte of data from the processor;

extending the transmission of said second enable signal from the input module to the output module; and

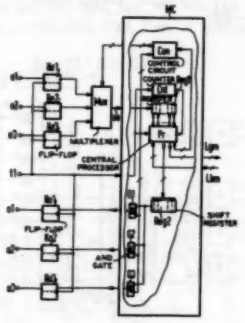
the output module receiving and responding to said second write signal and said second enable signal from the processor to receive a second byte of data from the processor.

4,691,297

CIRCUIT ARRANGEMENT FOR RECEIVING AND/OR TRANSMITTING SERIALLY APPEARING BINARY SIGNALS IN OR FROM A PROCESSING DEVICE CONTAINING A MICROCOMPUTER OR A MICROPROCESSOR

Pieter Wolff, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 4, 1985, Ser. No. 740,977
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1984, 3420786
Int. Cl.[4] G11C *7/00, 19/00*
U.S. Cl. 364—900 3 Claims



1. In a circuit arrangement for receiving binary signals serially appearing on a plurality of signal receiving lines, processing the binary signals in the form of parallel signals respectively encompassing a prescribed plurality of bits, and for the transmission of serially appearing binary signals via individual signal output lines after a previously ensuing processing of parallel signals respectively comprising the prescribed plurality of bits in and from a processing device containing a microprocessor means which is connected at its input and its output to the signal receiving and, respectively, signal output lines via signal receiving and signal output devices, respectively, the improvement wherein:

the signal receiving devices and the signal output devices each comprise a clock-controlled flip-flop connected to a respective receiving line and a respective output line for receiving serially appearing signal bits to be input and output, respectively;

a selection circuit having an input connected to each of said signal receiving devices and a single output connected to a single input of the microprocessor means such that the selection circuit selects the receiving device to be connected to the single input of the microprocessor means to process all of the received signal bits;

the microprocessor means comprises an input memory which receives the signal bits serially and output the same as parallel signal bits for processing, a microprocessor which processes the parallel signal bits, and an output memory connected to said microprocessor for receiving the processed bits and converting the same into serial form;

common clock means is connected to said signal receiving devices, said signal output devices and said microprocessor means for synchronizing the outputs of said signal receiving devices, said signal output devices and said microprocessor means; and

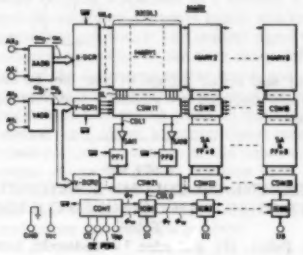
output selection means connected between said output memory and said signal output devices which selectively provides the processed and serial signal data bits thereto to said signal output devices in serial form.

4,691,298

SEMICONDUCTOR MEMORY

Minoru Fukuda, Tateno; Hideaki Takahashi, Koganei, both of Japan; June Sugiura, Troy, N.Y.; Fumio Tsuchiya, Kodaira, and Toshimasa Kihara, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1985, Ser. No. 770,576
Claims priority, application Japan, Sep. 26, 1984, 59-199576
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—189 12 Claims



1. In a semiconductor memory, the improvement for writing information comprising:

a memory array having data lines, including a plurality of nonvolatile semiconductor memory cells which can be erased and electrically written into;

external terminal means for receiving serially applied input signals to be written into the memory array;

a converter means having an input coupled to said external terminal means and having a plurality of outputs, said converter means responding to said serially applied input signals for converting said signals into a plurality of parallel produced output signals;

a select signal means for providing first select signals; and

a selector means controlled by said select signal means and having inputs corresponding in number and coupled to the respective outputs of said converter means, and having outputs greater than the number of the converter means outputs and represented by said data lines of the memory array, for providing said plurality of the parallel produced output signals to said data lines.

4,691,299

METHOD AND APPARATUS FOR REUSING NON-ERASABLE MEMORY MEDIA

Ronald L. Rivest, Arlington, Mass., and Adi Shamir, Rehovot, Israel, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

PCT No. PCT/US82/00564, § 371 Date Dec. 29, 1983, § 102(e) Date Dec. 29, 1983
PCT Filed Apr. 30, 1982, Ser. No. 565,210
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189 16 Claims

1. Apparatus for writing a plurality of times in a non-erasable memory comprising

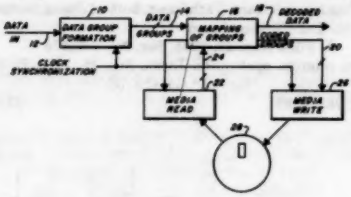
means for receiving incoming digital data and for forming sequential groups from said received data,

means for reading successive groups of digital data from successive groups of positions in the non-erasable memory,

means responsive to each said formed sequential group and to a respective read successive group from memory for generating successive new coded groups of digital data, and

means for sequentially writing into said memory each said

group of data at a said group of positions corresponding to said respective read group of data,



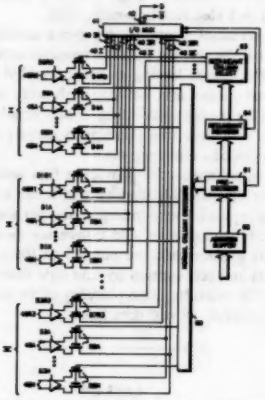
whereby said coded groups of data can be later read and uniquely decoded to generate said formed sequential groups.

4,691,300

REDUNDANT COLUMN SUBSTITUTION ARCHITECTURE WITH IMPROVED COLUMN ACCESS TIME

Perry H. Pelley, III, and Alan Lewandowski, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1985, Ser. No. 811,856
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—200 **4 Claims**



1. In a memory device having a predetermined number of normal columns of storage elements and a predetermined number of redundant columns of storage elements, a redundant column substitution apparatus comprising:

a multiplexer having inputs coupled to said normal and redundant columns of storage elements and outputs coupled to data pins of said memory device, said multiplexer being responsive to a control input to select one of said normal columns and said redundant columns;

first switch means interposed between said normal columns of storage elements and said multiplexer for selectively connecting at least one of said normal columns to said multiplexer;

second switch means interposed between said redundant columns of storage elements and said multiplexer for selectively connecting at least one of said redundant columns to said multiplexer;

normal column decoder means for receiving an address and for operating said first switch means

redundant decoder means for receiving an address, determining whether said address corresponds to a defective normal column of storage elements and providing at least one output signal in response to an address corresponding to such a defective normal column; and

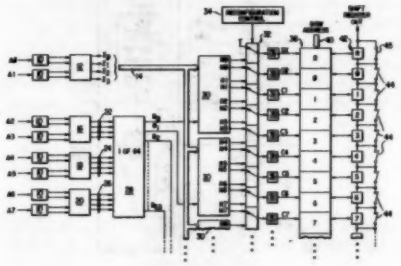
redundant column select means responsive to said at least one output signal received from said redundant decoder means and for operating said second switch means.

4,691,301

SEMICONDUCTOR MEMORY WITH REDUNDANT COLUMN CIRCUITRY

Daniel F. Anderson, Richmond, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 693,417, Jan. 22, 1985, Pat. No. 4,598,388. This application Jun. 20, 1986, Ser. No. 876,619
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—200 **9 Claims**



1. A fault-tolerant memory device, comprising:

an array of addressable read/write memory cells, said memory cells arranged in rows and columns, said columns having addresses ranging from a first limit to a second limit;

row decode means, responsive to a row address signal, for selecting a row of memory elements in said array;

column decode means, responsive to a column address signal, for selecting a column of memory elements in said array, said column decode means having an output corresponding to each column in said array, said column decode means providing a decode signal at the output corresponding to said column address signal;

output means for presenting the contents of the memory cell at the intersection of said selected row and selected column;

a redundant column of memory cells;

redundant column enable means having a first position and a second position, said redundant column enable means in its first position for disabling said redundant column, and in its second position for enabling said redundant column responsive to the output of said column decode means corresponding to said first limit;

column enable means, for each column in said array, said column enable means having a first position and a second position, said column enable means in its first position for enabling its associated column responsive to the corresponding output of said column decode means, and in its second position for enabling its associated column responsive to the output of said column decode means corresponding to the column having the column address adjacent thereto in the direction toward said second limit;

disable means for disabling a column, said column having a fault therein; and

redundancy control means, for causing the column enable means for each column having a column address between said first limit and the address corresponding to said disabled column to be placed in its second position and for

causing said redundant column enable means to be placed in its second position;

wherein said column enable means for each column having a column address between the address corresponding to said disabled column and said second limit said array is in its first position.

4,691,302

CIRCUIT ARRANGEMENT COMPRISING A MATRIX-SHAPED MEMORY ARRANGEMENT FOR VARIABLY ADJUSTABLE DELAY OF DIGITAL SIGNALS

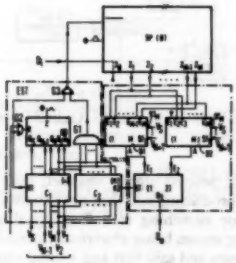
Hans J. Mattausch, Kirchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 28, 1986, Ser. No. 890,115

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1985, 3531598

Int. Cl.[4] G11C *8/00*

U.S. Cl. 365—240 **8 Claims**



1. A circuit arrangement comprising:

a matrix-shaped memory for variably adjustable delay of data signals, said memory including a plurality of memory cells arranged in columns and rows,

each of said memory cells comprising a pair of inverters each including an input and an output with the input of each inverter connected to the output of the other inverter and defining a pair of junctions, and a pair of switching transistors each including a control electrode and a controlled-conduction path connected to a respective junction,

a write word line and a read word line per row of said matrix-shaped memory, and

a write bit line and a read bit line per column of said matrix-shaped memory;

said write word line and said read word line of each respective row connected to respective control electrodes of said switching transistors of all memory cells of that row;

said write bit line and said read bit line of each of said columns connected to the controlled-conduction paths of respective transistors opposite respective junctions of each memory cell of that column;

an input data clocked row selector comprising a pluralilty of serially connected stages, said row selector being continuously steppable and arbitrarily resettable at any time, said row selector comprising two signal outputs per stage which are offset in phase relative to one another and respectively connected to and for selecting the write word line and a read word line of a respective row of memory cells, each of said stages of said row selector including a reset input connected to a common reset input for receiving a row selector reset signal, the first stage of this series further including a set input connected to said common reset input for receiving a row selector input signal to set the row selector to the respective row of memory cells;

a plurality of disconnectible storage amplifiers, each of said amplifiers including an input connected to the read bit line of the respective column and an output connected to the write bit line of the adjacent column and further serving as a delayed data output;

a data input for receiving data signals to be delayed connected to the write bit line of a first column and also serving as an undelayed data output;

a column selector for selecting columns of said matrix-shaped memory, said column selector comprising a plurality of data inputs connected to the undelayed data outputs, a delay setting input for receiving a portion of a delay time setting word defining a selection of a column, a control signal input for receiving a control signal, and switching means operable in response to said control signal to select the column corresponding to the time delay defined by said portion of the delay time setting word; and

a data clock control means including an input for receiving the complete delay time setting word, an input for receiving an external reset signal, a control signal output connected to said control signal input of said column selector, a reset output connected to said common reset input of said row selector, and means responsive to said external reset signal and to said delay time setting word to reset said control means and said row selector.

4,691,303

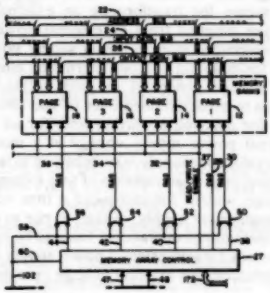
REFRESH SYSTEM FOR MULTI-BANK SEMICONDUCTOR MEMORY

Reed R. Churchward, Apple Valley, and Thomas L. Krocheski, Burnsville, both of Minn., assignors to Sperry Corporation, Blue Bell, Pa.

Filed Oct. 31, 1985, Ser. No. 793,519

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—222 **4 Claims**



1. A refresh system for a dynamic memory comprising at least one memory bank having memory cells arranged in rows and columns that are all to be refreshed during a memory refresh rate period comprising,

refresh timing means that repeatedly supplies a row refresh request at a row timing rate, which when multiplied by all of the rows of said memory to be refreshed equals a time period which is approximately equal to said memory refresh rate period,

busy detect means which signals when said memory is currently busy due to said memory accessed for reading or writing,

refresh supply means for supplying said row refresh request to groups of rows of said memory in a sequential cyclic manner to refresh said rows, wherein each group of rows comprises at least one row of said memory,

refresh lock-out means responsive to said busy detect means which prevents said row refresh request from being supplied by said refresh supply means during a lock-out per-

iod that lasts for an integral number of row timing rate periods, up to a predetermined maximum number of periods, while said memory remains busy, and

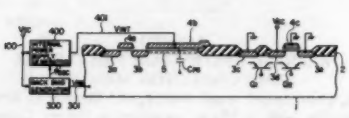
refresh burst timing means which supplies a burst of row refresh requests during a subsequent memory not busy burst interval to refresh a number or groups of said row up to said maximum number of consecutive row timing rate periods, which were locked-out from refresh by said refresh lock-out means during the time frame that proceeded said burst interval.

4,691,304

SEMICONDUCTOR DEVICE HAVING AN ARRANGEMENT FOR PREVENTING OPERATIONAL ERRORS

Ryoichi Hori, Tokyo, and Kiyoo Itoh, Higashikurume, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,092
Claims priority, application Japan, May 30, 1984, 59-108365
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—226 **18 Claims**



1. A semiconductor device formed on a semiconductor chip comprising:

a plurality of circuits formed on the semiconductor chip;

a voltage transformation means formed on the chip including means for transforming an external power supply voltage supplied from an external power supply into a predetermined internal power supply voltage;

means for coupling said predetermined internal power supply voltage generated by said voltage transformation means to predetermined ones of said circuits; and

means for delaying a starting time for an increase of said internal power supply voltage at a moment when said external power supply is switched on to start later than the starting time of an increase of said external power supply voltage, and/or for increasing a time necessary for said internal power supply voltage to rise to a predetermined internal voltage operational value to be longer than a time necessary for said external power supply voltage to rise to a predetermined external voltage operational value.

4,691,305

AUTOMATIC ATTENUATOR FOR SONOBUOYS

John H. Kuck, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Air force, Washington, D.C.

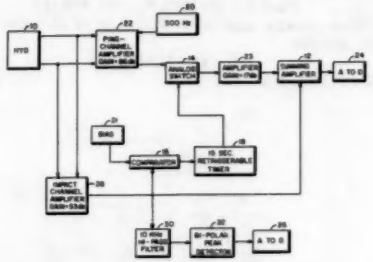
Filed Sep. 5, 1985, Ser. No. 772,814
Int. Cl.[4] H04B *11/00*
U.S. Cl. 367—3 **10 Claims**

1. In combination with a sonobuoy containing a hydrophone which detects first and second acoustic signals, said first acoustic signal having a relatively low amplitude when compared to said second acoustic signal, said sonobuoy having a radio frequency transmitter which transmits information by modulating a carrier with a first and second data stream, an automatic attenuator receiving all signals detected by said hydrophone and outputting said first acoustic signal in the form of said first data stream to said radio frequency transmitter while waiting for said second acoustic signal, said automatic attenuator conducting said second acoustic signal in the form of said first and second data streams to said radio frequency transmitter after said second acoustic signal is detected and verified while ceasing to output said first acoustic signal over said first data stream, said automatic attenuator comprising:

first and second signal channels each receiving acoustic signals from said hydrophone, said first signal channel isolating said first acoustic signal and producing an output signal by applying a high gain and narrow passband to acoustic signals received from said hydrophone;

said second signal channel isolating said second acoustic signal and producing said second data stream by applying a medium gain and peak detection to acoustic signals received from said hydrophone;

a means for summing the output signal of said first signal channel when available, with said second acoustic signal



from said second signal channel, said summing means thereby producing said first data stream; and

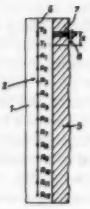
a means for switching said first signal channel off, said switching means being electrically connected to said summing means and said first and second signal channels, said switching means receiving and comparing all acoustic signals received by said second signal channel to a bias signal, said bias signal being a signal having a level relative to expected amplitudes in comparison with said second acoustic signal, said switching means switching off said first signal channel when said second acoustic signal is detected and verified so that the first data stream produced by the summing means does not contain said first acoustic signal.

4,691,306

METHOD FOR THE PROCESSING OF RECORDINGS OF SIGNALS RESULTING FROM A SEISMIC EXPLORATION OF A MEDIUM

Georges Arens, Croissy S/Seine, and Philippe Staron, Menaecy, both of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoi, France

Filed Jul. 12, 1985, Ser. No. 754,436
Claims priority, application France, Jul. 18, 1984, 84 11341
Int. Cl.[4] G01V *1/00*; G06F *7/48*
U.S. Cl. 367—40 **15 Claims**



1. Method for the processing of recordings of signals result-

ing from a transmission and a reception of acoustic waves propagating into a medium, comprising the steps of:

grouping the recordings in pairs such that in each pair the two recordings correspond to two acoustic paths including at least one non-common part defining a measuring space and at least one common part;

cross correlating the two recordings of each pair in order to obtain an elementary cross correlation function defining the time taken by the waves of the said pair to travel through the measuring space;

grouping the elementary cross correlation functions in at least one family in which the measuring spaces are included in a same predetermined reference space;

transforming the time variable of the elementary cross correlation functions in order to bring the dimension of their measuring space to the dimension of the reference space;

adding all the transformed cross correlation functions in order to form a sum cross correlation function of which the abscissas of the useful lobes represent the propagation time of the waves over the reference space.

4,691,307

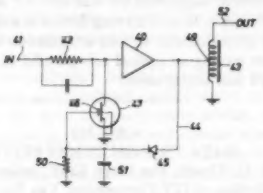
AGC CIRCUIT FOR TELEVIEWER

Frederick H. K. Rambow, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 459,443, Jan. 20, 1983, abandoned. This application Sep. 23, 1985, Ser. No. 778,770

Int. Cl.⁴ G01V *1/40*

U.S. Cl. 367—69 **18 Claims**



1. A system for acoustically mapping the wall of a borehole, comprising:

(a) a borehole televiewer including an acoustical transducer moveable within the borehole for transmitting successive acoustic signals toward successive portions of the borehole wall,

(b) circuit means in said borehole televiewer coupled to said transducer to cause said transducer to produce a sequence of acoustic pulses,

(c) amplifier means coupled to said transducer to produce a signal whose amplitude is related to the amplitude of the acoustic signal that is reflected from the borehole wall and received by said transducer, and

(d) amplitude gain control means coupled to said amplifier means to automatically control the amplitude of the output signal of said amplifier means at least in part as a known function of said received acoustic signal amplitudes, said function including rise and decay characteristics selected for compensating for geometrically induced cyclical variations in the received acoustic signal amplitude to avoid obscuring borehole wall anomalies while simultaneously protecting said amplifier from saturating, and thereby providing accurate representations of substantially the entire wall of the borehole portion being mapped.

4,691,308

APPARATUS FOR REPRODUCING INFORMATION FROM MAGNETOOPTICAL RECORDING MEDIUM

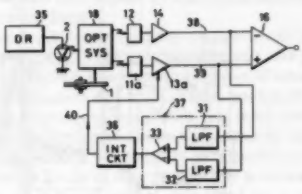
Akihiro Takagi, Kawasaki, and Kiyoshi Kimoto, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,186

Claims priority, application Japan, Apr. 19, 1984, 59-79280; Jun. 21, 1984, 59-128118

Int. Cl.⁴ G11B *11/10*

U.S. Cl. 369—13 **13 Claims**



9. An apparatus for irradiating a magnetooptical recording medium with a linearly polarized light beam and detecting the light from said medium, comprising:

(a) optical means for dividing the light from said medium into two light components having different planes of polarization, said optical means dividing the light from said medium in such a manner that the average intensity of one of said two light components is stronger than that of the other;

(b) first converting means for converting said one of said two light components into a first electrical signal with a determined amplification factor;

(c) second converting means for converting said other of said two light components into a second electrical signal, said second converting means comprising an avalanche photodiode; and

(d) control means for controlling said second converting means in such a manner that the amplification factor thereof becomes higher than said determined ampification factor, said control means including means for applying a voltage to said avalanche photodiode.

4,691,309

MAGAZINE FOR DISCS IN HOLDERS, AND COMBINATION OF A DISC-PLAYER WITH SUCH A MAGAZINE

Yukio Suzuki, Kanagawa, Japan, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 9, 1985, Ser. No. 753,199

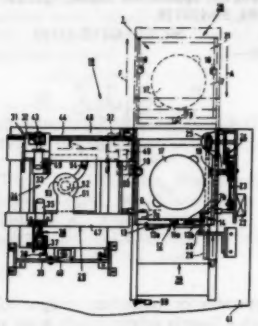
Claims priority, application Japan, Jul. 11, 1984, 59-103688[U]; Jul. 14, 1984, 59-105825[U]; Jul. 20, 1984, 59-108998[U]

Int. Cl.⁴ G11B *17/00, 5/48*

U.S. Cl. 369—38 **14 Claims**

1. A magazine for a plurality of disc-shaped information carriers accommodated in holders which are arranged above one another, which magazine comprises mutually parallel major walls near the top and bottom and side walls near two opposite sides, which side walls carry guide means for positioning the respective holders above one another, the two further opposed upright sides having respective first and second openings for sliding the holders into and out of the magazine in a direction parallel to the major walls, characterized in that the magazine comprises a latching lever which is situated near one of the side walls, which is pivotable about a pivotal axis which extends substantially perpendicularly to the major walls and which comprises two arms, which are situated on the opposite sides of the pivotal axis, which arms carry respective first and second latching elements near respective first and second openings, which latching lever is urged into a first position by spring means in which position the latching ele-

ments latches the holders in the magazine, which arms can each be actuated externally of the magazine to pivot the latching lever against the force of the spring means from the first position to a second or a third position, in which second and third position the holders can be slid through the first and the



second opening respectively, whilst in the second position and in the third position of the latching lever the second and the first latching element near the second and the first opening, respectively, are situated in a stop position in which they block the relevant opening for the passage of the holders.

4,691,310

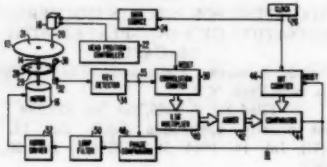
COMPACT DISK READ ONLY MEMORY RECORDING SYSTEM WITH SPEED CONTROL

Charles M. Wine, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 9, 1985, Ser. No. 763,969

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—50 **12 Claims**



1. A computer data recording system for recording information comprising bits of data in a spiral track on a recording surface of a rotating disk by a recording head moving radially with respect to the axis of rotation of said disk, said system comprising:

means for determining the radial position of said recording head;

means for determining the optimal number of bits of data to be contained in the convolution of said spiral track at the determined radial position;

means for counting the number of data bits provided from said recording head to said recording surface at said convolution; and

means for controlling the speed at which said disk rotates in response to a comparison of the optimal number of data bits and the number of data bits provided from said recording head for said convolution.

4,691,311

DISC READING APPARATUS WITH DISC SHOOT JOURNALED IN FRAME

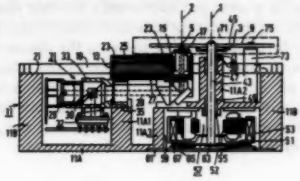
Gerardus L. M. Jansen, Colorado Springs, Colo.; Henricus J. Smulders, and Pieter D. Schultmaker, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 8, 1985, Ser. No. 752,885

Claims priority, application Netherlands, Jul. 10, 1984, 8402176

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—100 **6 Claims**



1. An apparatus for reading or writing information on an information surface of a rotating disc, said apparatus comprising

a one piece frame,

an electric motor having a motor shaft which is rotatable about an axis of rotation and which carries a turntable for the disc, said shaft being journalled in bearing means received directly in said frame,

a lens system driving device which is movable parallel to the information surface, said driving device being supported by guide means secured directly to said frame,

a lens system supported by said driving device for movement relative to said driving device in a direction substantially perpendicular to said information surface, said lens system having an optical axis parallel to the axis of rotation of said motor shaft.

4,691,312

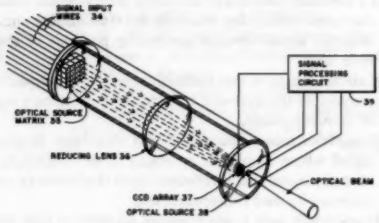
DATA TRANSMISSION SYSTEM

Weldon R. H. Vlasak, Van Nuys, Calif., assignor to ITT Gilfillan, a division of ITT Corporation, Van Nuys, Calif.

Filed Aug. 10, 1984, Ser. No. 639,635

Int. Cl.[4] H04J *3/00;* **H04B** *9/00*

U.S. Cl. 370—4 **4 Claims**

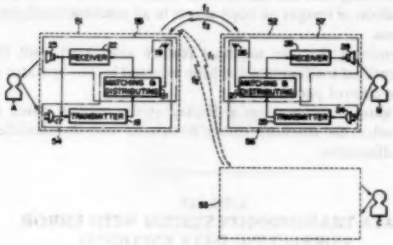


3. A data transmission system comprising: a wire cable; an optical source matrix to produce outputs corresponding to the outputs of said cable; a charge coupled device array; a reducing lens to focus the outputs of said optical source matrix onto said charge coupled device array; a signal processing circuit to scan said charge coupled device array; an optical source to be actuated by said charge coupled device array; an optical fiber having an input end positioned to receive the light output of said optical source; and demultiplex means at the ouput of said optical fiber to demultiplex light emanating therefrom.

4,691,313
WIRELESS TALKING APPARATUS

Keisuke Iwata, Tokyo, Japan, assignor to Iwata Electric Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1985, Ser. No. 688,565
Claims priority, application Japan, Nov. 9, 1984, 59-236033
Int. Cl.[4] H04B *1/50*
U.S. Cl. 370—30 **10 Claims**



1. A wireless talking apparatus for simultaneous talking comprising:

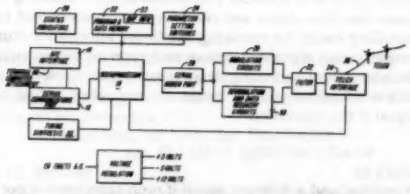
a main communication device including a microphone for producing a first voice signal, a transmitter for modulating a carrier wave of a frequency f_1 by the first voice signal and for transmitting a modulated carrier wave of the frequency f_1, a receiver for receiving a modulated carrier wave of a frequency f_2 and for demodulating the modulated carrier wave of the frequency f_2 to produce a second voice signal, and means connected between the transmitter and the receiver for applying the seond voice signal from the receiver to the transmitter to enable the transmitter to modulate the carrier wave of the frequency f_1 not only by the first voice signal but also by the second voice signal; and

a subsidiary communication device including a transmitter for transmitting a modulated carrier wave of the frequency f_2 to the main communication device, and a receiver for receiving the modulated carrier wave of the frequency f_1 modulated by the first voice signal and the second voice signal from the main communication device.

4,691,314
METHOD AND APPARATUS FOR TRANSMITTING DATA IN ADJUSTABLE-SIZED PACKETS

Lewis A. Bergins, Millis; Anthony P. Amundson, Holliston, and Jerry Falk, Medway, all of Mass., assignors to Microcom, Inc., Norwood, Mass.

Filed Oct. 30, 1985, Ser. No. 792,757
Int. Cl.[4] H04J *3/24, 3/16*
U.S. Cl. 370—94 **20 Claims**



1. A method of transmitting data in packets in a data telecommunications system, said system including an initiating unit of data terminal equipment and a receiving unit of data terminal equipment, a first modem connected between the initiating unit and communication lines and a second modem connected between said receiving unit and said communication lines, said method comprising the steps of:

transmitting a stream of data characters from said initiating unit to said first modem for transmission over communication lines to said second modem;

dividing said data stream received by said first modem into packets of data with each packet including additional, identifying data;

transmitting one data packet or one group of data packets at a time from said first modem to said second modem over communication lines;

checking data in said transmitted data packets for errors, and when an error is detected retransmitting said data packet;

incrementing a counter representing a number of retransmissions of data packets or groups of data packets for each data packet or group of data packets that is retransmitted;

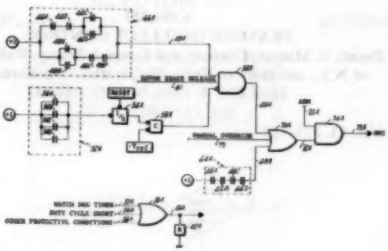
incrementing a counter representing a number of transmissions of data packets or groups of data packets for each data packet or group of data packets that is transmitted;

determining an optimum packet size based on a ratio of retransmissions to transmissions.

4,691,315
BACKUP CONTROL SYSTEM (BUCS)

Richard D. Murphy, Trumbull, and William C. Fischer, Monroe, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 22, 1985, Ser. No. 715,132
Int. Cl.[4] G06F *11/20*
U.S. Cl. 371—9 **4 Claims**



1. In a computer system (10) having at least two identical processors (12) and controlling a device (24), a method of providing control over the device comprising:

installing identical primary software in a portion (18) of memory (16) associated with each processor (12), said primary software directing the operation of the processors to control the device during normal operation;

installing backup software, dissimilar from the primary software, in an isolated portion (20) of memory (16) associated with at least one of the processors (12), said backup software capable of directing the operation of the processor(s) to control the device in the event of a sensed fault in the primary software affecting all processors;

sensing the fault in the primary software affecting all processors;

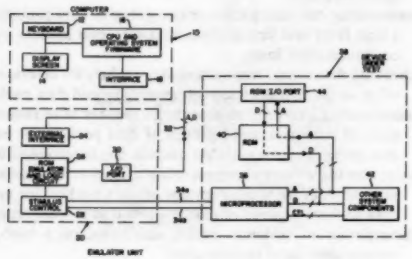
disabling the primary software and activating the backup software in response to sensing the fault in the primary software so as to maintain control over the device with the backup software associated with the at least one processor.

4,691,316

ROM EMULATOR FOR DIAGNOSTIC TESTER

Charles R. Phillips, Portland, Oreg., assignor to Support Technologies, Inc., Tigard, Oreg.

Filed Feb. 14, 1985, Ser. No. 701,770
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—20 **18 Claims**



1. Apparatus for testing an electronic system, said including a microprocessor and at least one ROM connected together by at least address and data busses, respectively, comprising:

(a) a programmable ROM emulator connected to said electronic system through a ROM input-output port for bi-directionally communicating with said microprocessor in place of said ROM;

(b) computer means connected to said ROM emulator for inserting test programs into said ROM emulator to be executed by said microprocessor; and

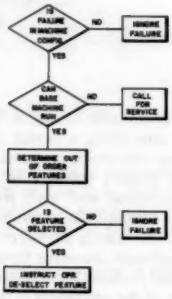
(c) logic circuit means in said ROM emulator connected to a bus from said ROM input-output port in communication with said microprocessor for reading the results of the said test programs in the form of test data signals.

4,691,317

FEATURE DESELECT CONTROL

Dennis E. Miazga, Fairport, and James J. Petery, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 4, 1985, Ser. No. 784,144
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—20 **6 Claims**



1. In a xerographic printing machine having a photoreceptor and a plurality of operating components cooperating with one another to produce images on support material, the operating components cooperating in various configurations to produce the images, and including a control panel providing an operator with the means to select the various machine features, various combinations of the features providing different machine configurations, some of the features being essential to producing images on the support material, other of the features only being essential in selected configurations to produce images on the support material, and a control having a fault location segment to identify machine malfunctions, the method of defeaturing the machine to continue operation upon the detection of a fault by the control comprising the steps of:

recognizing the existence of a machine malfunction in the control,

isolating the malfunction to a particular machine feature in a particular machine configuration,

determining that the malfunction is not essential to the production of images on copy sheets in all machine configurations,

determining that the machine feature associated with the identified malfunction has been selected by the operator at the control panel, and

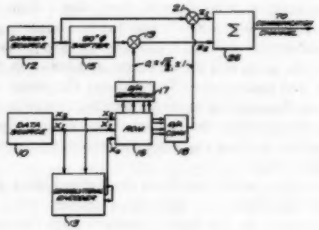
providing a message on a display at the control panel to deselect the machine feature associated with the identified malfunction.

4,691,318

DATA TRANSMISSION SYSTEM WITH ERROR CORRECTING DATA ENCODING

Alan W. Entenman, Bohemia, N.Y., assignor to Radyne Corporation, Bohemia, N.Y.

Continuation of Ser. No. 472,234, Mar. 4, 1983, abandoned. This application Jun. 19, 1986, Ser. No. 878,392
Int. Cl.[4] G06F *11/12*
U.S. Cl. 371—43 **1 Claim**



1. In combination in multiphase data communications apparatus for transmitting digital information, transmitter means for supplying at least one digital information data stream x_1, convolutional encoding means having an output bit stream x_0 for performing a continuous, non-block error correcting encoding on said data stream x_i and on its own output x_0 given by

$$x_0 = x_i G_i + x_0 G_0$$

where G_i and G_0 are independent Boolean expressions relating values over plural digit intervals of x_i and x_0 respectively to x_0, and signalling means coincidentally modulated by the x_0 output of said convolutional encoding means and by the digital information x_i supplied by said source thereof for disseminating plural carriers of different phases said carriers attaining one of more than four states, and receiving means connected to said signalling means for receiving the digital information from the output of said signalling means, said receiver means including decoder means, including delay means, each connected to the output of said signalling means for providing a first output signal if the expression

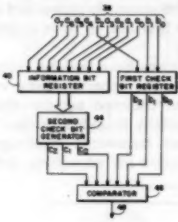
$$0 = x_i G_i + x_0(1 \pm G_0)$$

is satisfied and a different signal if such expression is not satisfied, and syndrome error detecting and correcting means enabled responsive to the output of said decoding means for selectively inverting the output of said received information depending upon the error state reported thereto by said decoding means.

4,691,319
METHOD AND SYSTEM FOR DETECTING A PREDETERMINED NUMBER OF UNIDIRECTIONAL ERRORS

Bella Bose, 4002 NW. Witham Hill Dr., No. 105, Corvallis, Oreg. 97330, and Der J. Lin, Corvallis, Oreg., assignors to Bella Bose, Corvallis, Oreg.

Filed Jun. 18, 1985, Ser. No. 746,109
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—54 8 Claims



1. In a data transmission system having a data source for producing an n-bit information code, a data sink for accepting a data word, and a data transmission channel for transmitting a data word from said data source to said data sink, a system for detecting at least t unidirectional errors in the transmission of said information code over said data transmission channel, comprising:

(a) first code generation means, associated with said data source, for producing, for a given information code in a predetermined set of n-bit information codes produced by said data source, a first m-bit check code according to the criteria that for all possible pairs of (n+m)-bit data words formed by said predetermined set of n-bit information codes and corresponding m-bit check codes, either the pair of words is unordered or the Hamming distance between the data words of the pair is greater than or equal to t+1, and there is at least one pair of said data words which is unordered and whose Hamming distance is less than t+1;

(b) transmission means for transmitting over said transmission channel a data word comprising an information code and its corresponding first check code;

(c) second code generation means, associated with said data sink, for producing, for a given information code accepted by said data sink, a second m-bit check code according to said criteria; and

(d) comparator means, associated with said data sink, for comparing, for a given data word accepted by said data sink, said first check code and said second check code and producing an indication of any disparity therebetween.

4,691,320
SEMICONDUCTOR STRUCTURE AND DEVICES

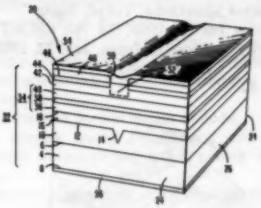
Nancy A. Dinkel, Spotswood; Bernard Goldstein, Princeton, and Michael Ettenberg, Freehold, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 11, 1985, Ser. No. 710,274
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 15 Claims

1. A semiconductor structure comprising a substrate having first and second opposed major surfaces;

a buffer layer having a thickness greater than about 4 micrometers thick overlying the first major surface and having a surface with a channel therein, said channel having a depth less than the buffer layer thickness; and

a first clad layer overlying the buffer layer and the channel and having a substantially planar surface;

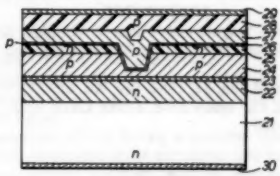


said substrate and said buffer layer being of one conductivity type with the resistivity of the buffer layer being substantially the same or less than the resistivity of the substrate.

4,691,321
SEMICONDUCTOR LASER DEVICE HAVING CURRENT CONFINING AND BUILT-IN WAVEGUIDE STRUCTURE

Nawoto Motegi, Kanagawa; Yukio Watanabe; Naohiro Shimada, both of Yokohama, and Masaki Okajima, Kunitachi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 26, 1984, Ser. No. 686,478
Claims priority, application Japan, Dec. 26, 1983, 58-246148
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—46 21 Claims



1. A semiconductor laser device having a resonant cavity, said device comprising:

a substrate;

a first clad layer of a first conductive type formed on one surface of said substrate;

an active layer formed on said first clad layer;

a second clad layer of a second conductive type formed on said active layer and having a groove portion;

a first current confining layer of said first conductive type covering said second clad layer and having a strip shape opening corresponding to said groove portion;

a first coating layer of said second conductive type covering said current confining layer and said opening having a refractive index larger than the refractive index of said second clad layer;

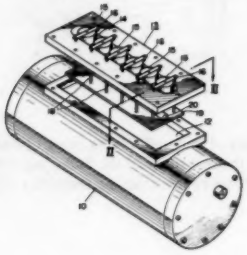
a second coating layer of said second conductive type covering said first coating layer and having a refractive index smaller than the refractive index on said first coating layer; and

a pair of electrodes attached to said second coating layer and said substrate respectively.

4,691,322
GAS LASER DEVICE

Yasuhiro Nozue, Yokohama; Koichi Kajiyama, and Kazuaki Sajiki, both of Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 22, 1986, Ser. No. 820,802
Claims priority, application Japan, Jan. 22, 1985, 60-9629
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—82 8 Claims

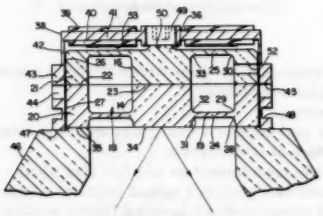


1. In a gas laser device of the type having an upper discharge electrode and a lower discharge electrode which is disposed to confront with said upper discharge electrode beneath a cover member for sealing a laser chamber and a plurality of capacitors arranged along the longitudinal direction of said discharge electrodes, wherein electric discharge is created between said discharge electrodes by a charged voltage of said plurality of capacitors so as to excite laser gas between said discharge electrodes, the improvement wherein a recess is formed on the upper surface of said cover member for accommodating said plurality of capacitors.

4,691,323
PATH LENGTH CONTROLLER FOR RING LASER GYROSCOPE

Bo H. G. Ljung, Wayne, and Walter J. Krupick, Succasunna, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jun. 11, 1984, Ser. No. 619,227
Int. Cl.[4] H01S *3/08, 3/083;* G01B *9/02*
U.S. Cl. 372—107 1 Claim

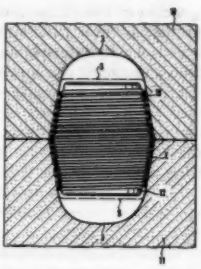


1. A ring laser gyro path length controller comprising:
an actuator fixture having a mounting surface connected to a gyro block;
a mirror assembly having a projection formed thereon, the assembly located within the fixture and independently connected to the block for permitting independent assembly and disassembly of the assembly from the fixture;
a mirror means formed in the assembly for reflecting laser beams along predefined paths in the block;
actuator means mounted to the fixture for selectively deflecting a portion of the fixture; wherein
displacement of the deflecting fixture portion causes translated deflection of the mirror means, and wherein
the mirror assembly comprises:
a first disc having first and second transverse surfaces, the first surface being substantially planar and the second surface having an annular recess formed therein so as to define the mirror means at the center of the surface, a remaining portion of the first surface being coplanar with the mirror means and forming a connection joint for connection with the block; and
a second disc having first and second transverse surfaces, the first surface being substantially planar and attached to the first surface of the first disc to form a unitary structure, and wherein
the first and second discs have annular recesses formed in their first surfaces, the recesses being complementary thereby forming an enclosed annular space within the assembly which radially bounds a central hub of the assembly and defines transverse diaphragm sections in spaced coaxial relation for permitting deflection of the mirror means.

4,691,324
ELECTRODE CONNECTION

Günter Kraus, Ehekirchen, Fed. Rep. of Germany, assignor to Sigri GmbH, Meitingen bei Augsburg, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,846
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1985, 3506908
Int. Cl.[4] H05B *7/14*
U.S. Cl. 373—91 9 Claims



1. Electrode connection between sections of carbon or graphite electrodes in whose faces are sunk, for the accomodation of double-conical threaded nipples with flat faces, threaded sockets of truncated-cone shape, a cone envelope enveloping the socket thread, and rotation-symmetrical recesses emanating from the socket base, wherein
(a) principle sections of the rotation-symmetrical recesses are defined by curves of the second or higher order,
(b) transition between the envelope of the socket thread and the defining curve is a continuously differentiable curve, and
(c) the defining curve forms right angles with a normal erected at the base of the envelope and with an axis of symmetry of the principle section.

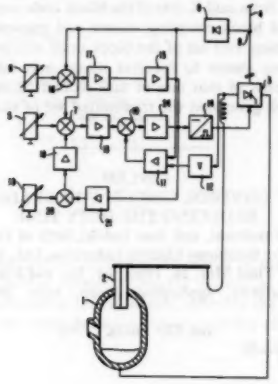
4,691,325
CONTROL APPARATUS FOR A DIRECT CURRENT ARC FURNACE

Claude Boisdon, Avon, France, assignor to Jeumont-Schneider Corporation, Puteaux cedex, France

Filed Feb. 20, 1986, Ser. No. 831,658
Claims priority, application France, Feb. 21, 1985, 85 02482
Int. Cl.[4] H05B *7/148*
U.S. Cl. 373—108 10 Claims

1. Control apparatus for an arc furnace having at least one

electrode powered with direct current from an alternating electric power source through a controlled-rectifier converter, comprising fast-response control loop means coupled to a control input means of said converter for adjusting the operation of said converter in response to the reactive energy drawn



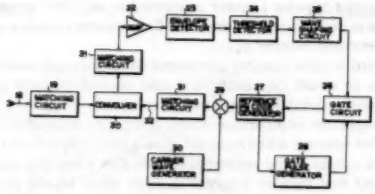
from said power source for stabilizing against rapid fluctuation in the reactive energy drawn from said power source, and a limiting circuit coupled to the control input means of said converter for limiting the current flow said converter passes to said electrode to a predetermined maximum intensity.

4,691,326

SPREAD-SPECTRUM COMMUNICATION SYSTEM

Masahiro Tsuchiya, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 722,720
Claims priority, application Japan, Apr. 17, 1984, 59-77789
Int. Cl.[4] H04L *27/30*
U.S. Cl. 375—1 **1 Claim**



1. A receiver in a spread-spectrum communication system adapted to receive a signal which is modulated by a binary code modulated by a binary code or data, including a surface acoustic wave filter for detecting a correlation between the received signal and a signal modulated by a time-reversed reference binary code of said binary code, said receiver comprising:

first means for producing a correlation spike pulse from a correlation waveform signal with a relatively large amplitude when said binary code in said received signal supplied from said surface acoustic wave filter coincides with or has a small displacement from said reference binary code;

second means for selectively extracting a desired correlation spike pulse from said correlation spike pulses from said first means and producing a reset pulse therefrom; and

a code generator for producing said reference binary code and initialized by said reset pulse, wherein said first means include:

an amplifier for amplifying said correlation waveform signal;

an envelope detector for extracting a signal having an envelope waveform in an output signal from said amplifier;

a threshold detector for comparing the amplitude of said envelope waveform signal with a predetermined threshold and generating a pulse responsive to the result of the comparison;

and wherein said second means include:

a wave shaping circuit for shaping said pulse from said threshold detector into a pulse with a predetermined width;

said reference binary code being synchronized by a synchronizing pulse;

a gate pulse generator for generating a gate pulse from said pulse synchronizing said reference binary code; and

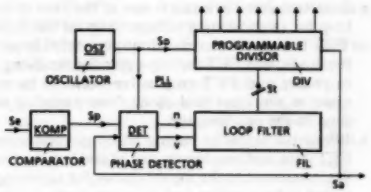
a gate circuit responsive to said gate pulse to selectively extract said pulse supplied from said wave shaping circuit.

4,691,327

CLOCK REGENERATOR

Bruno Wenger, Au, Switzerland, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 6, 1986, Ser. No. 860,273
Claims priority, application Switzerland, Jun. 10, 1985, 02440/85
Int. Cl.[4] H04L *25/60*
U.S. Cl. 375—4 **3 Claims**



1. A clock regenerator comprising:

a programmable divisor circuit which is connected to the output of an oscillator and having as an output a regenerated signal;

a comparator circuit having a received input eye signal for transforming said input eye signal into input pulses;

a phase detector for comparing the regenerated signal with the input pulses by means of an oscillator signal from said oscillator and which provides a lead signal and a lag signal, said phase detector being configured as a phase locked loop having an oscillator frequency of approximately N times higher than the regenerated frequency; and

a loop filter controlled by the lead and lag signals, wherein:

the loop filter comprises a first logic circuit which delivers an information signal, a reset signal and control signals;

a second logic circuit which receives the lead and lag signals and the information signal to indicate the sign and, the direction of the counting status and which provides a counter clock signal and a count direction signal for a counter having a reset input for receiving the signal, and wherein said first logic circuit has an input connected to the output of the counter, and wherein the regenerated signal has at least one delayed signal delayed by L/N periods where L is a low integer, to derive from the delayed signal a pulse window having at least three zones; and output signals of the phase detector represent which zone includes the edge of the input signal; and

first logic circuit for controlling the programmable divisor such that, when the edges of the input pulses fall in the most central zone of the three zones, the counter counts

toward zero and no correction of the output signal is initiated, and wherein the status of said counter is stored in said first logic circuit.

4,691,328

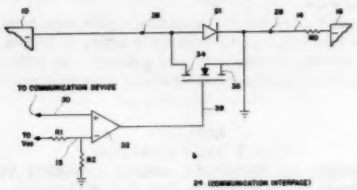
ON-LINE SERIAL COMMUNICATION INTERFACE FROM A COMPUTER TO A CURRENT LOOP

Edward L. Sterling, Jr., Cleveland, and William L. Thompson, Montville, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 12, 1985, Ser. No. 764,915

Int. Cl.[4] H04L *5/00*

U.S. Cl. 375—36 **6 Claims**



1. An on-line serial communication interface for a digital circuit for generating voltage pulses, to a current loop having lines for connecting a transmitter to a power supply to drain current from the power supply according to a process variable sensed by the transmitter, comprising:

a diode connected in series in one of the lines of the current loop for establishing a voltage drop on the diode;

an FET having a source and drain connected in parallel with the diode, said FET having a gate for receiving a voltage to render said FET conductive between its source and drain to short out said diode from applying its voltage drop to the one line; and

a differential amplifier having an output connected to said FET gate, and two inputs, one of said inputs of said amplifier connected to the digital circuit for receiving the generated voltage pulses and the other input of said amplifier being connected to a selected voltage whereby said amplifier output receives voltage pulses synchronized with the generated voltage pulses from said digital circuit to render said FET conductive and non-conductive in synchronism with the voltage pulses.

4,691,329

BLOCK ENCODER

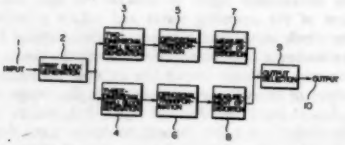
Tatsuro Juri, Hirakata; Akira Iketani, Higashiosaka; Chojuro Yamamitsu, and Akifumi Ide, both of Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 1, 1986, Ser. No. 880,992

Claims priority, application Japan, Jul. 2, 1985, 60-143914; Jul. 19, 1985, 60-160598

Int. Cl.[4] H04N *1/40, 7/12*

U.S. Cl. 375—122 **9 Claims**



1. A block encoder apparatus, comprising: first block generating means for constituting large-size blocks each composed of N sample points by dividing sample points of an image exhibiting continuity in three dimensional directions inclusive of a time-axis direction in a three-dimensional space; K varieties of second block generating means for dividing each of said large size blocks obtained by said first block generating means into small size blocks; block encoding means for generating K sets of block code words by block-encoding each of said K sets of small-size blocks obtained through said second block generating means; selecting means for selecting one set of the block code words from said K sets of the block code words obtained through said block encoding means; and transmitting means for transmitting said set of the block code words selected by said selecting means to receiver means and informing said receiver means of that one of said second block generating means which generated the transmitted set of the block code words.

4,691,330

DUTY CONTROL CIRCUIT FOR GRADUALLY REDUCING THE DUTY TIME

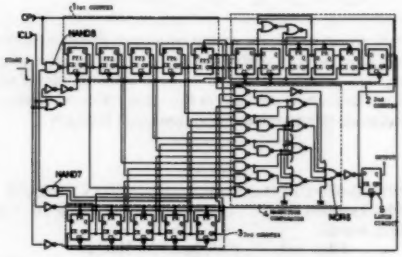
Shinichiro Takahashi, and Isao Isshiki, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 26, 1986, Ser. No. 844,478

Claims priority, application Japan, Mar. 29, 1985, 60-44890[U]

Int. Cl.[4] H03K *21/00*

U.S. Cl. 377—39 **1 Claim**



1. A duty control circuit for controlling a duty factor, comprising:

a first n-pulse counter for counting a series of pulses;

a second m-pulse counter connected to said first counter so as to count one each time said first counter counts a predetermined number n;

a third n-pulse counter connected to said second counter so as to count one each time said second counter counts another predetermined number m; and

a magnitude comparator which comprises the count of said first counter with the count of said third counter and gives an output signal corresponding to ON when the count of said first counter is larger than, or equal to, the count of said third counter, and gives an output signal corresponding to OFF when the count of said first counter is smaller than the count of said third counter.

4,691,331

SELF-CORRECTING FREQUENCY DIVIDERS

Robert J. Bayruns, Middlesex, and Harry T. Weston, New Providence, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 665,986, Oct. 29, 1984. This application Nov. 25, 1986, Ser. No. 935,170

Int. Cl.[4] H03K *21/00, 23/40*

U.S. Cl. 377—47 **24 Claims**

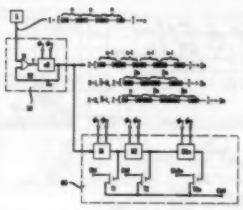
1. In combination:

(a) a source of an n-bit counting stream of period equal to nT, where n is an integer greater than unity;

(b) a two-input NOR gate having one of its two input termi-

nals connected for receiving the n-bit counting stream from the source;

(c) a delay device having n serially connected stages each arranged for delaying bit flow therethrough by an amount of time equal to T, said delay device having its input



terminal connected for receiving the output of the NOR gate and its output terminal directly connected to the other input terminal of the NOR gate, whereby the output terminal of the delay device develops a 2n-bit counting stream.

4,691,332

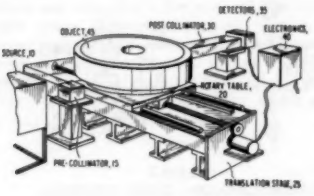
HIGH ENERGY COMPUTED TOMOGRAPHY

Paul Burstein, Arlington; Allen Krieger, Lexington; Martin Annis, Cambridge, and Richard C. Chase, Tewksbury, all of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 474,937, Mar. 14, 1983, abandoned. This application Mar. 14, 1984, Ser. No. 589,443

Int. Cl.[4] G01N *3/02*

U.S. Cl. 378—7 **12 Claims**



1. A system for a high energy CT imaging of targets of substantial size and density comprising:

a source of penetrating radiant energy of energy in excess of one million electron volts,

a plurality of radiant energy detectors spaced from said source,

means for supporting a target of size and density substantially greater than a human body between said source and said detectors for relative movement in a direction transverse to an axis connecting said source and said detectors and for relative rotation about a second axis perpendicular to a plane including said source and said detectors, wherein the improvement comprises:

collimating means for restricting an acceptance angle of said detectors to substantially less than 1 degree.

4,691,333

BREAST COMPRESSION AND NEEDLE LOCALIZATION APPARATUS

Joseph M. Gabriele, 846 Carole La., Fenton, Mich. 48430; George J. Sam, Sr., 22306 Grove Pt., St. Clair Shores, Mich. 48081; John N. Wolfe, 4707 E. St. Antoine, Detroit, Mich. 48210, and Navinchandra J. Parekh, 3159 Middlebury La., Birmingham, Mich. 48010

Filed Dec. 27, 1985, Ser. No. 817,568

Int. Cl.[4] A61B *6/04, 10/00;* **G03B** *42/02;* **H05G** *1/28*

U.S. Cl. 378—37 **20 Claims**

1. A breast compression device for use in mammographic radiological investigations comprising:

a sleeve made of a material having a generally low level of x-ray attenuation and having an opening adapted to receive a mammographic film cartridge;

a breast compression plate made of a material having a generally low level of x-ray attenuation and having a plurality of perforations disposed in a matrix;

first and second flexible straps extending between and interconnecting said plate and said sleeve, said straps each being secured on one end to spaced locations on said breast compression plate and each of said straps being secured at spaced anchoring locations to said sleeve; and

adjustment means included on at least one of said straps for adjusting the length of said straps extending between said plate and said sleeve and biasing said plate towards said sleeve to compress at least one breast between said plate and said sleeve.

4,691,334

X-RAY EXAMINATION APPARATUS

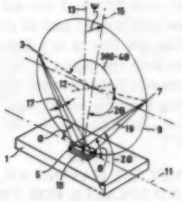
Ulrich M. E. A. Wolfstieg, Bad Herrenalb, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 11, 1984, Ser. No. 659,799

Claims priority, application European Pat. Off., Oct. 12, 1983, 83201456

Int. Cl.[4] G01N *23/207*

U.S. Cl. 378—71 **15 Claims**



1. An X-ray examination apparatus comprising an X-ray source, an object receiving X-rays from said source, and an X-ray detector receiving X-rays from said object, the improvement comprising means for arranging said X-ray source, an irradiated area of said object, and a slit of said X-ray detector on a Seemann-Bohlin focusing circle, a mechanical shaft ex-

tending along a θ axis perpendicular to a focusing plane at the center of said Seemann-Bohlin focusing circle, said X-ray detector and a primary beam from said X-ray source being continually aimed at said irradiated area, and means for tilting said Seemann-Bohlin focusing circle transversely to said focusing plane about an axis through the center of said irradiated area to provide ψ inclination.

4,691,335

PRIMARY RADIATION DIAPHRAGM FOR X-RAY DIAGNOSTICS DEVICES

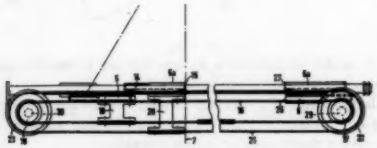
Gerhard Telorack, Aurachtal, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 5, 1985, Ser. No. 795,245

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1984, 8436281[U]

Int. Cl.[4] G21K *1/04*

U.S. Cl. 378—152 **2 Claims**



1. A primary diaphragm for limiting x-radiation having a central ray emanating from an x-ray focus in an x-ray diagnostic installation, said primary diaphragm comprising:

first and second pairs of diaphragm plates, the plates in each pair being in a common plane and said pairs being in spaced parallel planes perpendicular to said central ray;

a first pair of wheels of a first diameter carried on separate spaced axles;

a second pair of wheels of a second diameter also respectively carried on said spaced axles, said first diameter being smaller than said second diameter;

a first belt entrained around said wheels of said first diameter and having upper and lower portions which move in opposite directions upon rotation of said axles respectively connected to said plates in said first pair of diaphragm plates in a plane farther from said x-ray focus for moving said plates in said first pair toward and away from each other; and

a second belt entrained around said wheels of said second diameter and having upper and lower portions which move in opposite directions upon rotation of said axles respectively connected to said plates in said second pair of diaphragm plates in the plane closer to said x-ray focus for moving the plates in said second pair toward and away from each other, said first and second diameters being selected such that said second pair of plates in said plane closer to said focus are moved at a faster rate upon rotation of said axles than the plates in said first pair in the plane farther from said focus and the plates in the spaced planes overlapping at every plate position.

4,691,336

TELEPHONE TEST SET HAVING AN AUXILIARY AMPLIFIER AND SPEAKER FOR PERMITTING LISTENING TO LINE SIGNALS

Thomas W. Durston, Camarillo, Calif., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 10, 1986, Ser. No. 917,480

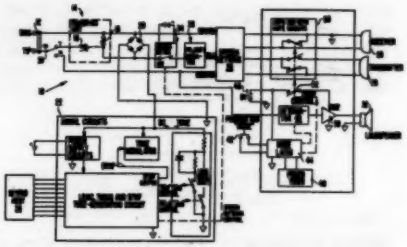
Int. Cl.[4] H04M *3/22*

U.S. Cl. 379—21 **10 Claims**

1. A telephone test set comprising:

means for coupling the test set to tip and ring lines of a telephone lines;

means for transmitting signals on the telephone line and means for receiving signals on the telephone line; the means for transmitting and the means for receiving being selectively coupled to the means for coupling;



selectively energizable amplifier means for amplifying signals appearing on the telephone line;

speaker means coupled to the amplifier means for reproducing signals appearing on the telephone line; and

control means for disabling the means for transmitting and the means for receiving when the amplifier means is energized to prevent acoustic feedback to the amplifier means.

4,691,337

METHOD AND APPARATUS FOR DETERMINING THE VALUE OF ANALOG VOLTAGES OCCURRING ON TELEPHONE SUBSCRIBER LINES OF A DIGITAL TELEPHONE EXCHANGE

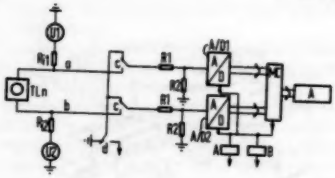
Gabriele Held-Elbert, Lochhofen; Wolfgang Kaiser, Munich, and Werner Schmutzler, Fuerstenfeldbruck, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 9, 1986, Ser. No. 849,653

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1985, 3515613

Int. Cl.[4] H04B *3/46*

U.S. Cl. 379—24 **5 Claims**



1. A method for determining the values of analog voltages occurring on subscriber lines of a preferably digital telephone exchange, particularly for the purpose of locating faults, characterized by the steps of scanning separately first and second analog voltage values prevalent at a point of a subscriber line circuit for ground potential at periodic intervals with reference to the two wires of a subscriber line and performing for each voltage value respectively an analog-digital conversion; storing the respective first and second digital values, as well as a digital value corresponding to the difference between the scanning values in storage locations of a pair of correspondingly allocated storage locations; that during an interval equivalent to the longest a.c. voltage period which reasonably can be expected, comparing the digital values obtained from a subsequent scanning respectively with the first and second corresponding stored digital values, whereupon, depending on

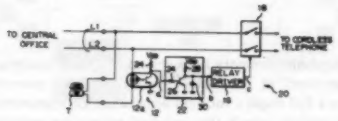
whether said values are larger than one or smaller than the other stored digital value, replacing one or the other of said digital values, so that, each time, the maximum value and minimum value of the voltages, which are valid for said interval, are maintained; and determining respectively the d.c. voltage value, the a.c. voltage, and the external voltage value, between the wires (a,b) of the subscriber line or between each of said wires and the circuit point conducting the ground potential from said maximum and minimum values.

4,691,338

LINE SWITCHING CIRCUIT FOR CORDLESS TELEPHONE

Masayuki Makino, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 18, 1986, Ser. No. 908,573
Claims priority, application Japan, Sep. 30, 1985, 60-218387
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—61 **6 Claims**



1. In a communications system having a telephone which is connected to a central office by a subscriber's telephone line and a cordless telephone which comprises a mobile unit and a base unit, said base unit being connected to said telephone, said telephone having priority over said cordless telephone with regard to use of said subscriber's telephone line, a line switching circuit for controlling connection between said cordless telephone and said subscriber's telephone line, comprising:

detector means for outputting a first and a second voltages when said telephone is on-hook and off-hook, respectively;

signal transferring means for transferring an output signal of said detector means by delaying said output signal a predetermined period of time if said output signal is derived from a first change from said first voltage to said second voltage and not delaying said output signal if said output signal is derived from a second charge from said second voltage to said first voltage;

opening and closing means for controlling connection between said subscriber's line and said base unit; and

control means for controlling said opening and closing means such that said opening and closing means opens and closes in response to said first change which is delayed by said predetermined period of time and said second change which is not delayed, respectively, which are outputted by said signal transferring means.

4,691,339

ADDRESS CODE ARRANGEMENTS

Michael J. Redman, Bishops Stortford; Ming K. Wong, Harlow, and Peter R. Sugden, Brighouse, all of England, assignors to STC plc, London, England

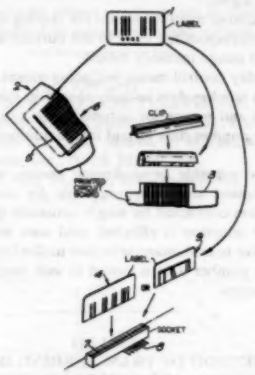
Filed Aug. 9, 1985, Ser. No. 764,114
Claims priority, application United Kingdom, Sep. 4, 1984, 8422288
Int. Cl.[4] H04Q 7/04
U.S. Cl. 379—62 **1 Claim**

1. An addressing arrangement for use in the handset and/or in the base station of a cordless telephone set, which arrangement includes:

(a) a circuit board having a contact field formed by a single strip-like conductive track to which a power supply is connected when the arrangement is in use and a set of conductive tracks on the board each of which terminates adjacent to the single strip-like track, the tracks of said set extending substantially orthogonally to the single strip-like track;

(b) label means of insulative material for carrying a set of generally parallel conductive strips, the pattern of said strips on the label means corresponding to an identification address for the handset or base station; and

(c) means to secure the said label means to the circuit board of the handset or base station such that the conductive strips on the label connect the single strip-like track on the



board to a selection of the conductive tracks on the board, which selection corresponds to the identification address of the handset or base station;

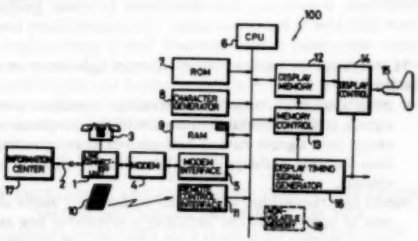
wherein when the handset or base station with the addressing arrangement is in use the single strip-like track is energized so that the said selection of the tracks on the circuit board which corresponds to the address is energized, and wherein the establishment of a connection is only effected if the address of the handset and the base station correspond.

4,691,340

IMAGE INFORMATION ACCESSING USER TERMINAL

Satoru Maeda, and Akihiko Tao, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 22, 1985, Ser. No. 800,822
Claims priority, application Japan, Nov. 28, 1984, 59-251273; Apr. 20, 1985, 60-85237
Int. Cl.[4] H04M 11/08
U.S. Cl. 379—96 **8 Claims**



1. A user terminal for displaying one of a plurality of images transmitted in the form of respective image data and image number data from an information center over a communications network in response to commands therefor entered at said user terminal, said user terminal comprising:

network terminal means adapted to be connected to said

communications network for receiving said image data and image number data therefrom and for supplying said commands thereto;

display control means including image memory means for storing received image data and for generating a video signal in response to said stored image data, said image memory means initially storing the image number data corresponding to the current image data;

display means for displaying an image corresponding to said video signal;

image number memory means for storing the image number data corresponding only to the current image data stored in said image memory means;

said display control means including means for detecting the image number data initially stored in said image memory means and means for automatically storing the detected image number data in said image number memory means; and

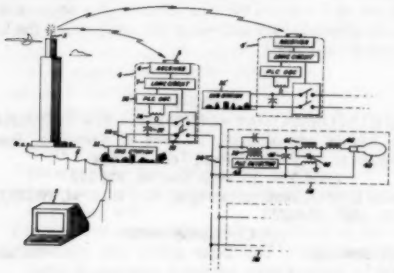
manually actuable input keying means including unitary autorequest key means actuable for entering an image selection command by single actuation thereof by which image selection is effected, said user terminal being responsive to said image selection to display an image whose image number data is stored in said image number memory means.

4,691,341

METHOD OF TRANSFERRING DIGITAL INFORMATION AND STREET LIGHTING CONTROL SYSTEM

David W. Knoble, E. Flat Rock, and Joseph W. Sanders, Flat Rock, both of N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,834
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—97 **11 Claims**



11. A system for remote control of street lights over an area comprising:

a programmable computer generating wavelike control signals at fundamental frequencies in the telephone vice range, said signals having half periods corresponding in time-duration to the pulses or bits of binary digits in logic circuits,

means for transmitting said signals by ordinary audio channels of communication, including a telephone line and a shared paging transmitter used primarily for paging and voice messages,

local receivers in said area receiving said signals and including means for squaring-off the received signals,

local microcomputers receiving said square-off signals, each microcomputer being programmed to respond to said signals only when they are legitimate and addressed to it, and

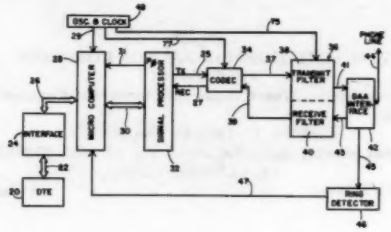
local means controlled by the local microcomputer for turning street lights off and on, and for dimming them.

4,691,342

MULTI-SPEED, FULL DUPLEX MODEM

Mark A. Waldron, Elkhart, Ind., and Tommy Y. Leung, Cassopolis, Mich., assignors to CTS Corporation, Elkhart, Ind.

Continuation-in-part of Ser. No. 530,690, Sep. 9, 1983, Pat. No. 4,620,294. This application Apr. 21, 1986, Ser. No. 854,136
Int. Cl.[4] H04M *11/06;* **G06F** *3/00*
U.S. Cl. 379—98 **20 Claims**



1. A telephone network between an originate modem and an answer modem, at least one of said modems comprising a multi-speed full duplex modem apparatus for transmitting and receiving analog signals through said telephone network; said multi-speed, full duplex modem comprising:

(a) a data terminal means for transmitting and receiving digital data;

(b) a microcomputer means in communication with the data terminal means;

(c) a bi-directional bus in communication with the microcomputer means;

(d) a signal processor means in communication with the microcomputer means over the bi-directional bus;

(e) a timing means responsive to the digital data, for bi-directional communication of digital data over the bi-directional bus;

(f) a converting means in communication with the signal processor means for converting digital data from the signal processor to the analog signal for transmission over the telephone network, and for converting the received analog signal from the telephone network to the digital data; and

(g) a selecting means in communication with the microcomputer means for selecting a bit rate mode using the digital data from the data terminal means; said selecting means further providing a means responsive to the bit rate of the originate modem, to selectively communicate one of at two or more data rates selected from 0–300 b.p.s. by frequency shift keying, approximately 600 b.p.s. by differential phase shift keying, approximately 1200 b.p.s. by quarternary differential phase shift keying, and approximately 2400 b.p.s. by quadrature amplitude modulation; the selecting means further providing a means for selecting digital data samples at intervals determined by the bit rate mode, to synthesize the digital data modulated for transmission through the converting means to the analog signal for transmission over the telephone network for communication between the originate modem and the answer modem.

4,691,343

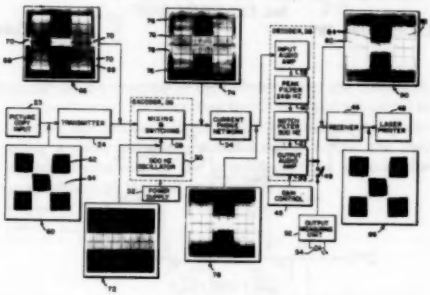
NOISE ELIMINATION SYSTEM FOR PICTURES AND THE LIKE

David M. Tenenbaum, 75 Palmer St. Apt. 214, Quincy, Mass. 02169

Filed May 27, 1986, Ser. No. 867,488
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—100 **20 Claims**

1. A system for eliminating degradation in quality of a picture or negative sent from a first location via signals transmit-

ted over a dialed-up telephone line in a telephone network to a second location at which a receiver and picture reproducing means are located, in which means coupled to said dialed-up line are provided at said first location for translating the picture or negative to be sent into audio frequency signals of a predetermined operating frequency, and in which a receiver is coupled to said dialed-up telephone line at said second location for receiving the audio frequency signals representing the transmitted picture or negative and for coupling the received signals to said picture reproducing means at said second location comprising:



means at said first location for superimposing a carrier signal on the transmitted audio signals, said carrier signal being of a frequency different from the operating frequency of the audio frequency signals coupled to said phone line but within the audio bandwidth of said telephone network; and,

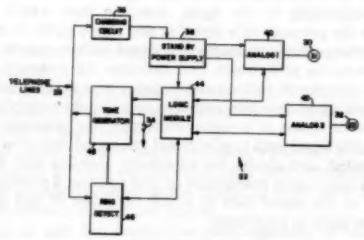
means at said second location for removing said carrier signal to provide a carrier-removed signal for use by said picture reproducing means.

4,691,344

LOW-POWERED REMOTE SENSOR AND TELEPHONE LINE TRANSMITTER

Richard W. Brown, Mound, and Duane R. Ardolf, Maple Grove, both of Minn., assignors to Aquatrol Corporation, Arden Hills, Minn.

Filed Jan. 21, 1986, Ser. No. 821,429
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—106 **6 Claims**



1. A data transmitter unit for transmitting data over conventional telephone lines from a remote location to a central location, the data transmitter unit deriving its operational power supply from the telephone lines to which it is interconnected, thereby doing away with the requirement for a separate power supply, the data transmitter unit comprising:

(a) ring detector means interconnected to the telephone line for detecting a ring signal sent over the telephone line to the remote location from the central location and actuating the unit in response thereto;

(b) pulse rate frequency transmitter means interconnected to the telephone line for transmitting on the telephone line from the remote location to the central location pulses of a tone where the tone comnprises signals of one or more predetermined frequencies, the rate of the pulses and the one or more frequencies representing different types of data; and

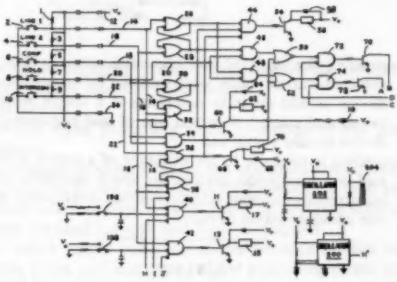
(c) charging circuit means interconnected to the telephone lines for providing power at the end of a transmission cycle to a stand-by power supply means for powering the data transmitter unit during a subsequent transmission cycle, the stand-by power supply means including capacitor means charged to a predetermined voltage.

4,691,345

MULTIFUNCTION TWO LINE TELEPHONE SYSTEM

Richard J. McAlevey, Miami; Malcolm D. Muir, Coral Springs, and Johan S. van der Laan, Miami, all of Fla., assignors to Rice Multiphones, Inc., North Miami, Fla.

Filed May 12, 1986, Ser. No. 861,928
Int. Cl.[4] H04M *9/02*
U.S. Cl. 379—158 **9 Claims**



1. A multi-function two line telephone comprising: means for receiving a first and a second telephone line each line including tip and ring lines; a line circuit for each of said telephone lines, each of said line circuits including first and second comparators connected to said telephone line for comparing the signals on said line with predetermined reference signals, and opto-isolator means connected to said comparators for isolating said line circuits; transformer means for inductively coupling said telephone lines; opto-isolated triac means connected between said telephone lines and said transformer means for connecting said lines in a conference connection; pushbutton switch means connected to said triac means for switching same to implement said conference connection; second pushbutton switch means connected to said triac means for implementing a hold function; further pushbutton switch means connected to said telephone lines; relay means connected between said further pushbutton switch means and said telephone lines; said further pushbutton means actuating said relay means to implement an intercom function.

4,691,346

PBX INTEGRITY ARRANGEMENT FOR MAINTAINING THE FUNCTIONAL INTEGRITY OF PBX COMMUNICATION DEVICES AND ASSOCIATED FACILITIES

Vincent D. Vanacore, Boulder, Colo., assignor to American Telephone and Telegraph Company and AT&T Information System Inc., both of Holmdel, N.J.

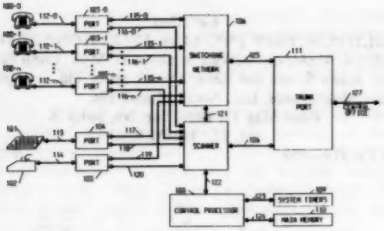
Filed Mar. 6, 1986, Ser. No. 836,912
Int. Cl.[4] H04M *1/66*
U.S. Cl. 379—198 **21 Claims**

1. In a PBX having a plurality of communication devices and trunk facilities where each of said communication devices and

said trunk facilities are connected to a corresponding port circuit of said PBX and which PBX operates under control of a processor, a method for checking the integrity of each of said communication devices and said trunk facilities wherein said method comprises the steps of:

storing a finite list of communication device invalid states each of which represents a lack of integrity of said communication devices;

polling on a periodic basis all of said communication devices to detect a current state of each of said communication devices;



comparing for each of said communication devices said detected current state with said list of communication device invalid states to determine if a match exists between said current state and one of said communication device invalid states; and

providing in response to the existence of a match at one of said communication devices, an action indicative of the occurrence of a communication device invalid state at said one communication device.

4,691,347

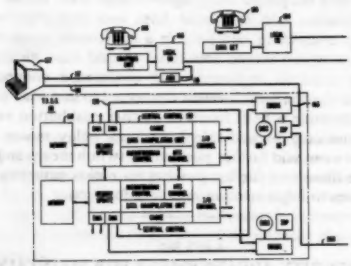
METHOD AND APPARATUS FOR CONTROLLING A CONFERENCE

Keith R. Stanley, Winfield, and David F. Winchell, Glen Ellyn, both of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 15, 1985, Ser. No. 702,378

Int. Cl.[4] H04M *3/56*

U.S. Cl. 379—203 **17 Claims**



1. For use in a communication system having a plurality of stations, a conference bridge and means for interconnecting said stations to said bridge for conferencing, a method of controlling stations connected to the bridge comprising the steps of

summoning an operator position in response to a request from said bridge,

transmitting to said operator position a data message containing the directory number of and the status of all stations originally connected to the bridge.

identifying at said operator position one of said stations independently of the directory numbers transmitted thereto, and

transmitting a message to said bridge from said operator position to control the one identified station.

4,691,348

TWO WAY TELEPHONE COMMUNICATION SYSTEM

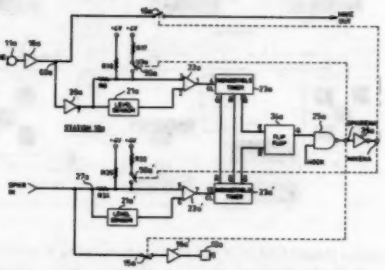
Russell E. Brasthen, Calgary, Canada, assignor to Novatel Communications Ltd., Calgary, Canada

Filed May 6, 1985, Ser. No. 730,590

Claims priority, application Canada, Oct. 30, 1984, 466643

Int. Cl.[4] H04M *9/08*

U.S. Cl. 379—389 **8 Claims**



8. A two way telephone communication system comprising a station having a first signal path for signals to be transmitted to another station, a second signal path for signals received from another station, switching means for selectively enabling one of said signal paths and disabling the other of said signal paths, and automatic direction decision means for controlling said switching means to either maintain the one of said signal paths that is enabled in an enabled state or to change the state thereof to disabled, said automatic direction means including control means for switching said switching means, a first signal detection path connected between said first signal path and said control means and including therein means for deriving and supplying to said control means signals indicating the presence of a signal in said first signal path, a second signal detection path connected between said second signal path and said control means and including therein means for deriving and supplying to said control means signals indicating the presence of a signal in said second signal path, the control means responding to the signal detection path which first indicates the presence of a signal in said signal paths to cause the switching means to enable the signal path to which said signal detection path which first indicates the presence of a signal in said signal paths is connected, signal delay means in one of said signal detection paths for delaying the supplying to said control means of a signal indicating the presence of a signal in the signal path to which said one signal detection path is connected, and means for selectively enabling said delay means in response to enablement of, and continued presence of a signal in, the signal path to which the other of said signal detection paths is connected.

4,691,349

DUPLEX MICROPHONE COMMUNICATION SYSTEM

Kenneth R. Reichel, Hudson, and Steve Hebrock, Akron, both of Ohio, assignors to Audio-Technica U.S., Inc., Stow, Ohio

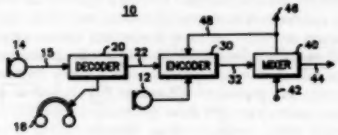
Filed Mar. 11, 1986, Ser. No. 838,587

Int. Cl.[4] H04B *3/20*

U.S. Cl. 379—391 **13 Claims**

1. A full duplex communications system for providing simultaneous bi-directional signal transmission between first and second ends of a two center conductor shielded communications channel, comprising:

encoder means for balanced coupling of a talkback signal to both center conductors of the communications channel at the first end thereof utilizing the communications channel shield as ground reference, thereby transmitting a common-mode signal to the second end of the communications channel;



decoder means, coupled to the second end of the communications channel, for decoding the common-mode signal to recover the talkback signal and for simultaneously coupling a differential microphone signal across the two center conductors of the communications channel for transmission to the first end thereof.

4,691,350

SECURITY DEVICE FOR STORED SENSITIVE DATA

Theodoor A. Kleijne, Dreumel, and Jan B. Goossens, De Bilt, both of Netherlands, assignors to NCR Corporation, Dayton, Ohio

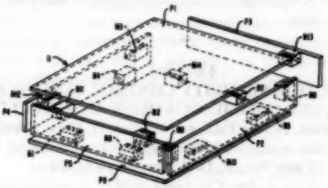
Filed Jun. 23, 1986, Ser. No. 877,049

Claims priority, application United Kingdom, Oct. 30, 1985, 8526689

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[4] H04L *9/00*

U.S. Cl. 380—3 **9 Claims**



1. A security device for protecting stored sensitive data comprising:

a closed housing containing memory means adapted to store sensitive data including conductive path means and conductive sheet means;

said conductive path means including a plurality of interconnected first and second conductive path segments;

said conductive sheet means including a plurality of interconnected conductive sheets;

each of said first conductive path segments, an associated second conductive path segment and an associated conductive sheet being arranged in superposed relationship and being separated by insulating material;

and tamper detection circuitry connected to said conductive path means and said conductive sheet means including a reset signal generating means arranged to provide a reset signal to erase the contents of said memory means in the event of interruption of said conductive path means or electrical interconnection between said conductive path means and said conductive sheet means brought about by an attempt to penetrate said housing.

4,691,351

TELEVISION SIGNAL RECEIVING APPARATUS

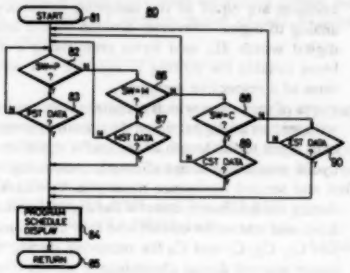
Toshihide Hayashi, Tokyo; Ikuo Kanayama, Kanagawa, and Masayoshi Kanno, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 29, 1985, Ser. No. 803,017

Claims priority, application Japan, Nov. 29, 1984, 59-252142; Dec. 3, 1984, 59-255495

Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—10 **7 Claims**



1. A television signal receiving apparatus having a program schedule display function, comprising:

tuner means;

television signal processing means connected to said tuner means;

digital signal processing means and associated switch means connected to said tuner means for generating a local program schedule display signal based on program schedule data obtained through said tuner means; and

said switch means being switchable between at least two time zones, and said digital signal processing means providing said local program schedule display signal with times based on a time zone selected with said switch means.

4,691,352

ARRANGEMENT FOR DECIPHERING AND DECODING TELEVISION PICTURES ENCODED IN ACCORDANCE WITH THE MAC STANDARD AND SCRAMBLED AT TRANSMISSION BY SUBMITTING THE VIDEO SIGNALS TO CYCLIC PERMUTATIONS

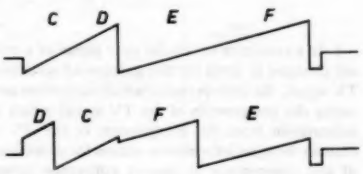
Jean-Pierre Arragon, Roissy-En-Brie, and Jean-Pierre Michel, Yerres, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1985, Ser. No. 711,545

Claims priority, application France, Mar. 16, 1984, 84 04099

Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—14 **9 Claims**



1. A digital circuit for decoding television picture signals comprising separate components of the MAC type which are scrambled with cyclic permutations, said scrambled signal

being descrambled from addresses X_1 of points of cut produced by a pseudo-random address generator comprising:

two two-way circuits receiving from an analog to digital converter said scrambled signal in serial digital form for processing the luminance component and four two-way circuits for processing the chrominance component, each comprising:

a circuit for converting the serial digital signal information in two rearranged bytes, whereby a writing speed for memories which are to receive said serial digital signal is accommodated such that the access rate of the memory columns are equal to the sampling frequency F_s of the analog to digital converter divided by the length of two digital words 2L, said bytes comprising even and odd bytes suitable for writing in separate low and high portions of a respective memory;

two sets of memories which are alternately read and written with said serial digital signal data, each memory having n1 cells equal to the length of the useful signal on which said cyclic permutations are effected, comprising:

first and second luminance memories Y_1 and Y_2 receiving during the luminance interval the digital luminance signals from said converter circuit, and four chrominance memories C_1, C_2, C_3 and C_4 for receiving during the chrominance interval digital chrominance signals from said converter circuit, each of said memories having a high portion and a low portion and an associated read amplifier, a read/write circuit for writing and reading data to and from said memories, including a permutating circuit connecting a high portion to a low portion address circuit, whereby alternately received even and odd bytes are written into high and low portions of each memory; and

a parallel to series conversion register for serially rearranging data read from a memory; and,

a circuit for decoding the address of the points of cut of the MAC type signal from information supplied by a pseudo-random sequence generator which supplies column addresses of the memories Y_1, Y_2, C_1, C_2, C_3 and C_4 and which directs during a write phase of said memories data bytes to said memories.

4,691,353

SCRAMBLING SYSTEMS FOR CATV

James O. Farmer, Doraville, Ga., assignor to Scientific Atlanta, Inc., Atlanta, Ga.

Filed Feb. 25, 1985, Ser. No. 704,817
Int. Cl.[4] H04N 7/167
U.S. Cl. 380—15 **13 Claims**

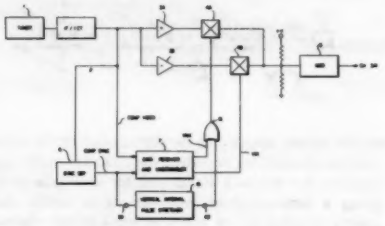
1. In a system in which the sync pulses of a color TV signal are changed in level for the purpose of scrambling the color TV signal, the improvement which comprises means for separating the components of the TV signal which contain color information from the components of the TV signal which contain the sync information, means for processing at least one of said components to remove coherence between the sync components and the color components, and means for recombining said separated components after processing in said processing means to provide a composite signal to which the sync pulses cannot be restored using the color components of said TV signal alone.

4,691,354

VERTICAL INTERVAL DATA BLANKER

Craig R. Palminteri, Mount Prospect, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 518,230, Jul. 28, 1983, abandoned. This application Apr. 10, 1986, Ser. No. 850,208
Int. Cl.[4] H04N 7/167
U.S. Cl. 380—15 **7 Claims**



1. In an addressable cable television signal decoder of the type including means for recovering data carried on one or more horizontal lines occurring during the vertical blanking interval of a conventional television signal that includes a serrated vertical sync pulse and pre and post equalizing pulses, and including data receiver and unscrambler means for recovering said data, developing a VNX signal for blanking said data from said television signal and for generating a control signal by integration of said serrated vertical sync pulse to control generation of said VN signal, and a transmission gate controlled by said VNX signal; the improvement comprising:

means for generating an additional stretched pulse signal by integration of said serrated vertical sync pulse;

gate means coupled to said transmission gate; and

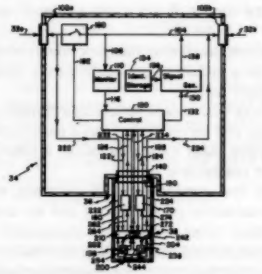
means for applying said stretched pulse signal and said VNX signal to said gate means to delay blanking of said data by said VNX signal until after occurrence of said post equalizing pulses.

4,691,355

INTERACTIVE SECURITY CONTROL SYSTEM FOR COMPUTER COMMUNICATIONS AND THE LIKE

Peter Wirstrom, Pepper Pike, and William H. Cork, Brecksville, both of Ohio, assignors to Pirmasafe, Inc., Cleveland, Ohio

Filed Nov. 9, 1984, Ser. No. 670,326
Int. Cl.[4] H04L 9/00
U.S. Cl. 380—23 **38 Claims**



1. Apparatus for vertifying the authorization of a user of at least one communications station that is connected for accessing another communications station through a communications link, the apparatus comprising:

(a) encryption means for being carried by an "authorized

user," namely a person who is authorized to use at least one communications station to access another communications station through a communications link that connected the at least one station to the another station, the encryption means including a first encryption that has a value which has been assigned to the authorized user as an indicator of the authorized user's authority to access the another station and a second variable portion representing the time of the last successful access of the another station;

(b) security means interposed in series between portions of the communications link for monitoring signals that are transmitted along the communications link, the security means defining port means for receiving the encryption means and for cooperating with the encryption means to detect a predetermined authentication query signal sequence of monitored signals that is transmitted along the communications link from the host computer and, in response to such detection, effecting transmission of an autheniticating signal sequence along the communications link, to the host computer with the value of the authenticating signal sequence being determined at least in part by the value of the first encryption and of a further encryption resident in said security means and representative of the identity of a predetermined terminal associated therewith so that the value of the authenticating signal sequence constitutes an indicator of the user's and terminal's authority to access the another station;

(c) authorization check means connected to the communications link for entering into a communications dialog with the security means as by transmitting the predetermined authentication query signal sequence along the communications link so that the authentication query signal sequence, when detected by the security means, will cause the security means to transmit the authenticating signal sequence along the communications link to indicate to the authorization check means whether the authorized user's encryption means is received by the port means for cooperating with the security means to cause the authenticating signal sequence to constitute an indication of the user's authority and the particular connected terminal's authority to access the another station; and,

(d) the encryption means including control means for interactively cooperating with the security means in the conduct of said dialog whereby, in the absence of the encryption means being received by the port means, said dialog cannot be properly conducted.

4,691,356

AM/FM SYNCHRONIZING CIRCUIT

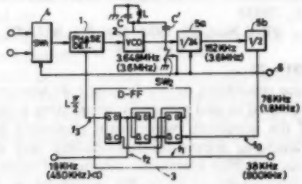
Toshihito Ichikawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 886,720

Claims priority, application Japan, Jul. 18, 1985, 60-110414[U]

Int. Cl.⁴ H04N 5/00

U.S. Cl. 381—4 **5 Claims**



1. An AM/FM synchronizing circuit, comprising:

switching means for alternatively selecting an AM intermediate frequency signal and an FM composite signal; and

phase locking means for producing a signal synchronized with an intermediate frequency carrier of said AM intermediate frequency signal when said AM signal is selected and a signal synchronized with a pilot signal of said FM composite signal when said FM signal is selected, said phase locking means having an input coupled to an output of said switching means:

said phase locking means comprising:

phase comparing means for receiving an output of said switching means as a reference signal;

voltage-controlled oscillating means controlled by an output of said phase detector;

frequency dividing means for dividing a frequency of an output of said voltage-controlled oscillating means; and

means for controlling a division factor of said frequency dividing means.

4,691,357

STEREOPHONIC RECEIVING CIRCUIT PROVIDING IMPROVED SWITCHING CHARACTERISTICS BETWEEN STEREOPHONIC AND MONAURAL MODES

Nobuo Kanda, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,461

Int. Cl.⁴ H04H 5/00

U.S. Cl. 381—10 **4 Claims**

1. In a stereophonic receiving circuit in which a control voltage of a magnitude determined in accordance with the strength of a received signal is applied to control operations of an IF signal processing section including an electronic volume control circuit, a high-cut control circuit, and a stereophonic demodulator circuit, the improvement wherein said control voltage is generated by a circuit comprising: means for producing an S-meter voltage in response to an IF signal in said receiver; means for amplifying said S-meter signal only when said S-meter signal is above a predetermined level; and means for applying a greater one of said S-meter signal and an output of said amplifying means for controlling said operations of said electronic volume control circuit, said high-cut control circuit, and said stereophonic demodulator circuit.

4,691,358

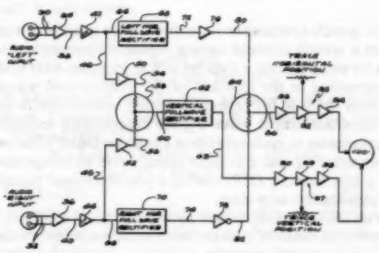
STEREO IMAGE DISPLAY DEVICE

John R. Bradford, c/o B&B Systems, 28111 N. Ave. Stanford, Valencia, Calif. 91355

Filed Apr. 14, 1986, Ser. No. 851,855

Int. Cl.⁴ H04H 5/00

U.S. Cl. 381—12 **6 Claims**



1. A device for providing a display on a cathode ray tube indicative of the stereo image and aural perspective of a first

stereophonic signal and a second stereophonic signal from different channels of a multichannel stereophonic system, comprising:

first means for processing said first and said second stereophonic signals to produce a rectified sum output, said processing means including a summing network and a rectifier;

second means for processing said first and said second stereophonic signals to produce a rectified difference output, said means including a plurality of rectifiers, an inverting amplifier and a summing network;

oscilloscope display means having a cathode ray tube with a display screen and having first deflection control circuits connected to said first processing means for receiving said rectified sum output and having second deflection control circuits connected to said second processing means for receiving said rectified difference output.

4,691,359

SPEECH SYNTHESIZER WITH REPEATED SYMMETRIC SEGMENT

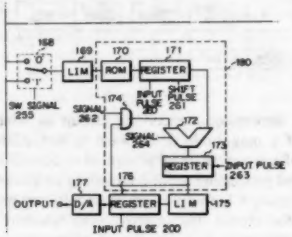
Makoto Morito, Tokyo, Japan, assignor to OKI Electric Industry Co., Ltd., Tokyo, Japan

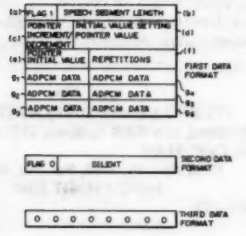
Filed Dec. 5, 1983, Ser. No. 558,205

Claims priority, application Japan, Dec. 8, 1982, 57-213971

Int. Cl.[4] G06F *9/00*

U.S. Cl. 381—51 **3 Claims**





1. A speech synthesizer for reproducing speech comprising at least a speech element having repeated symmetrical waveforms by using at least a data set which includes ADPCM data corresponding to the first half of the symmetrical waveform, repetition times R for repeating similar waveforms, a pointer increment/decrement value P_D for determining amplitude of the waveforms in each repetition cycle, an initial value setting pointer value P_L and a pointer initial value P_I comprising:

(a) a first memory (170) storing a predetermined plurality of quantization step sizes,

(b) means (158–160) which provide initially zero and accumulated value of pointer increment/decrement value P_D in each repetition cycle,

(c) means (157, 161, 168) for providing read address to said first memory (170), which provides initial symmetrical data in each repetition cycle, said means providing as read address an initial set pointer value P_L for output of initial data of the first symmetrical waveform, and said means providing as read address a sum of initial value set pointer P_L and accumulated value of pointer increment/decrement value P_D for output of initial data of the succeeding symmetrical waveforms,

(d) a second memory (163) for providing pointer moving value D_n according to ADPCM data L_n which is given as an address data in first half cycle, and said second memory providing pointer moving value D_n by using said ADPCM data L_n in opposition sequence in latter half cycle,

(e) pointer value output means (164–168) for providing address data of said first memory (170) for providing data X_n for succeeding data after said initial data of symmetrical waveform in each repetition cycle, said means providing for the first waveform,

(e-1) a pointer initial value P_I at initial time for providing symmetrical waveform,

(e-2) an accumulated sum of output D_n of second memory (163) during reproduction of former half of symmetrical waveform,

(e-3) a value which is obtained by subtracting sequentially output D_n of said second memory (163) from the last value of said accumulated sum during reproduction of the latter half of symmetrical waveform, and said means further providing for succeeding waveforms,

(e-4) a sum of pointer initial value P_I and accumulated pointer increment/decrement value which is output of means (158–160) at initial stage,

(e-5) an accumulated sum of output D_n of second memory (163) during the former half of the symmetrical waveform, and

(e-6) the value of which is obtained by subtracting sequentially the output D_n of said second memory (163) from the last value of said accumulated sum in the latter half of the symmetrical waveform,

(f) ADPCM reproducing means (170–174) for providing synthesized digital speech by

(f-1) providing the content of said first memory (170) in address designated by said means (157, 161, 168) as initial data in each repetition of the symmetrical waveform,

(f-2) providing the accumulated sum of said initial data and differential reproduced value q_n which is obtained by the calculation using output X_n of said first memory (170) in an address designated by pointer output means (164–168) and ADPCM data L_n, and

(g) a digital-to-analog converter (177) for converting synthesized digital speech issued from said ADPCM reproducing means (170–174) to an analog form to provide an output speech signal.

4,691,360

VOICE SIMULATOR

John W. Bloomfield, III, 19 Oyster Landing, Hilton Head Island, S.C. 29938

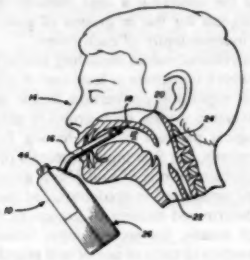
Filed Nov. 26, 1985, Ser. No. 802,585

Int. Cl.[4] A61F *1/20*

U.S. Cl. 381—70 **7 Claims**

1. A voice simulating device having a dc source of voltage, means connected to said source for generating a signal characteristic of the acoustical wave form produced by a human larynx, transducer means for reproducing said signal as an audible tone, amplifier means connecting said signal generating means to the transducer means for amplification of the signal reproduced by the transducer means and conduit means for transmitting the audible tone from the transducer means into a human oral cavity wherein the tone is adapted to be transposed into intelligible speech, the improvement comprising a housing enclosing the voltage source, the signal generating means, the transducer means and the amplifier means and means pivotally mounting the conduit means in the housing for displacement

thereof between extended and retracted positions, said housing having a face portion from which the conduit means projects



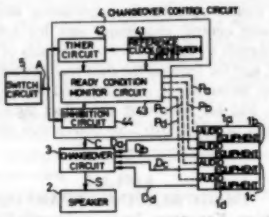
in the extended position and a groove formed within the face portion within which the conduit means is seated in the retracted position thereof.

4,691,361

SPEAKER CHANGEOVER DEVICE

Yasuhisa Yoshino, Okazaki, and Masahiko Osada, Hekinan, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 9, 1985, Ser. No. 785,852
Claims priority, application Japan, Oct. 9, 1984, 59-212237
Int. Cl.[4] H04B 3/00
U.S. Cl. 381—81 **7 Claims**



1. A speaker changeover device comprising:

a plurality of audio equipments, each outputting an audio signal, each of said plurality of audio equipments generating a ready condition signal at the time when a power source switch of each of said plurality of audio equipments is turned on;

at least one speaker to which the audio signal is inputted;

a cycle start switch;

a changeover control means for cyclically monitoring the ready condition signal from each of said plurality of audio equipments in order, for detecting one audio equipment which first generates the ready condition signal in each monitor cycle and for generating a changeover signal, said changeover control means stopping the monitor cycle at the time when the changeover signal is outputted, and restarting the monitor cycle at the time when said cycle start switch is turned on; and

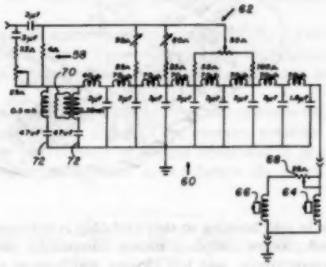
a changeover means for connecting said one audio equipment which first generates the ready condition, signal, to one of said at least one speaker in accordance with the changeover signal.

4,691,362

DIHEDRAL LOUDSPEAKERS WITH VARIABLE DISPERSION CIRCUITS

Steven J. Eberbach, 950 Fountain, Ann Arbor, Mich. 48103

Continuation of Ser. No. 457,035, Jan. 10, 1983, Pat. No. 4,578,809. This application Mar. 24, 1986, Ser. No. 843,152
The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.
Int. Cl.[4] H03G 5/00
U.S. Cl. 381—99 **4 Claims**



1. A loudspeaker comprising an inward set of drivers and an outward set of drivers, both sets generally forward facing, each set including a high frequency driver and a lower frequency driver, one set located at a dihedral angle relative to the other set to direct sound energy away from each other and the sets being substantially the horizontal interaural distance apart, wherein the inward set of drivers is intended to generally face a listening area and the outward set of drivers is intended to generally face away from the listening area, and

a first circuit connected to the pair of high frequency drivers, selectable means to adjust the level of acoustic output of the outward facing high frequency driver lower than the inward facing high frequency driver while maintaining the summed acoustic output on the plane bisecting the dihedral angle substantially constant, and

a second circuit connected to the pair of lower frequency drivers, selectable means to adjust the level of acoustic output of the outward facing lower frequency driver lower than the inward facing lower frequency driver while maintaining the summed acoustic output on the plane bisecting the dihedral angle substantially constant, and

said selectable means for adjusting the relative acoustic output between the pair of high frequency drivers and the selectable means for adjusting the relative acoustic output between the pair of lower frequency drivers maintaining substantially constant the perceived tonal balance radiated by the loudspeakers regardless of the relative acoustic output of the outward facing drivers relative to the inward facing drivers.

4,691,363

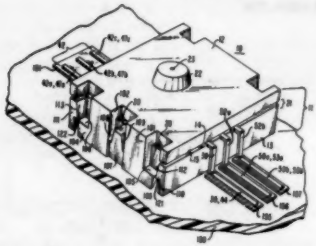
TRANSDUCER DEVICE

Satya P. Khanna, Indianapolis, Ind., assignor to American Telephone & Telegraph Company, AT&T Information Systems Inc., Murray Hill, N.J.

Filed Dec. 11, 1985, Ser. No. 807,636
Int. Cl.[4] H04R 19/01
U.S. Cl. 381—205 **17 Claims**

1. A transducer device comprising: a silicon microtransmitter chip, a housing for said chip comprising top and bottom transversely-displaced insulative closures having their front ends in registration at an interface between them in a transversely central region of said housing, and having respective acoustic cavities extending rearwardly thereinto from their

front ends, said closures at their front ends having respective end surfaces facing towards each other and extending around the respective acoustic cavities formed in said closures and separated from each other by a discontinuity between them providing said interface between said closures, said top closure having a sound port formed in the top thereof to communicate with the cavity therein, chip-mounting means mounting said chip in said region in longitudinally and laterally centralized



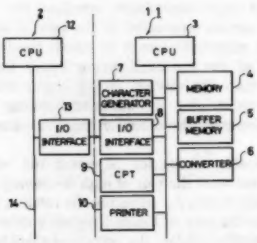
relation in said housing so that said chip is between said cavities, and closure coupling means comprising parts integral with, respectively, said top closure and bottom closure and snap-fittable together to lock said closures together in predetermined fixed relation and to cause said end surfaces to be in flush pressure engagement with each other at said interface when said closures are locked together by said closure coupling means.

4,691,364

BIT PATTERN CONVERSION APPARATUS

Takahiko Fukuzawa, and Kiyoshi Kitahara, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,220
Claims priority, application Japan, Feb. 15, 1984, 59-24949
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—41 **5 Claims**



1. A bit pattern conversion apparatus for use witha central porocessing unit, comprising:

data latch means including n groups of memory sections, each group of said memory sections having m data input terminals, a data write terminals for receiving a data write signal, and m memory elements each arranged to permit to independently write data information thereinto and independently read out same therefrom, for storing therein data supplied to said m input terminals in response to the data write signal, said data latch means constituting an m-row by n-column matrix memory circuit;

first data readout means including m groups of gate sections which constitute row-column conversion means, each group of gate sections having n logical product circuits having first and second input terminals, the first input terminals of said n logical product circuits of one section of said m groups of gate sections being connected respectively to n memory elements of one row of said data latch means, the second input terminals of said n logical product circuits being connected in common to form a data readout terminal for a corresponding one group of gate sections and for receiving a data readout signal, the data readout signals for the m groups of gate sections being supplied independently of each other;

second data readout means including plural groups of gate sections which constitute at least one of a non-conversion means, an expansion conversion means and an 8-bit to 6-bit conversion means, each group of gate sections having m logical product circuits having first and second input terminals, the first input terminals of said m logical product circuits of one of said plural groups of gate sections being connected to predetermined memory elements of a predetermined number of groups of sections of said data latch means, the second input terminals of the m logical product circuits of one of said plural groups of gate circuit being connected in common to form a data readout terminal for a coresponding one group of gate sections for receiving a data readout signal, the data readout signals for said plural groups of gate sections being supplied independently of each other;

a logical sum circuit including m logical sum gates each operable to logically sum up outputs supplied from corresponding ones of the gate elements of said first and second data readout means;

a MSB/LSB conversion circuit including m select gate means each having a first and second input terminals and select terminals, the first input terminals of the m select gates being connected to the m logical sum gates of said logical sum circuit in a first order, the second input terminals of the m selected gates being connected to the m logical sum gates of said logical sum circuit (ORM) in a second, reverse order, each of the m select gate means being adapted to be connected to said logical sum circuit, so that either one of the first and second input terminals is selected in accordance with the presence or absence of a select signal supplied to the select terminals; and

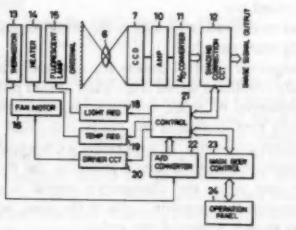
decoder means operable in accordance with a command from said central processing unit for sending the data write signals to the data write terminals of said data latch means, and for sending the data readout signals to the data readout terminals of said first and second data readout means, and for supplying the select signal to the select terminals of said MSB/LSB conversion circuit.

4,691,365

IMAGE READING APPARATUS

Nao Nagashima, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1984, Ser. No. 614,239
Claims priority, application Japan, Jun. 1, 1983, 58-97168
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—54 **38 Claims**



1. An image reading apparatus comprising:

a light source;

reading means for photoelectrically reading an image in

accordance with an optical image of a member illuminated with light from said light source;

a standard surface as a standard for reading of the image by said reading means;

control means for controlling the amount of light emitted by said light source in accordance with a read signal obtained by reading the standard surface by means of said reading means; and

correcting means for correcting an image read signal from said reading means in accordance with the read signal obtained by reading the standard surface by means of said reading means,

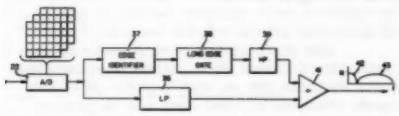
wherein said correcting means corrects the image read signal beginning after the amount of light emitted by said light source becomes a predetermined value under control of said control means.

4,691,366

IMAGE ENHANCEMENT

Paul Fenster, Petach Tikva, and Yair Shimoni, Jerusalem, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Nov. 7, 1984, Ser. No. 668,946
Claims priority, application Israel, Nov. 13, 1983, 70213
Int. Cl.[4] G06K *9/40*
U.S. Cl. 382—54 **16 Claims**



1. A method using filtering for image enhancement in digital fluorography, said method comprising the steps of:

(a) acquiring an image that comprises data of interest, data not of interest, and noise; said data of interest being amplitudes of edges having a finite linear dimension of at least two pixels, said noise having amplitudes with an average at a certain frequency that is substantially equal to an average amplitude of said edges, the average amplitude of the noise at frequencies higher than said certain frequency being higher than the average amplitude of said edges, and the average amplitude of the noise at frequencies lower than said certain frequency being lower than the average amplitude of said edges, said edges being enhanced at said higher frequencies;

(b) determining system parameters that effect filter optimizing procedures;

(c) using the system parameters to provide filter means that have different frequency responses to said data of interest than to said data not of interest or said noise; and

(d) filtering with said filter means to increase said certain frequency and thereby optimally enhance the data of interest and attenuate the data not of interest and the noise relative to the data of interest.

4,691,367

METHOD AND APPARATUS FOR OMNIDIRECTIONAL READING OF DATA BASES

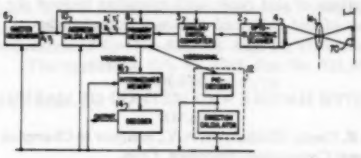
Klaus Wevelsiep, Fuchstanzstrasse 11, 6239 Kriftel, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,544
Int. Cl.[4] G06K *9/20*
U.S. Cl. 382—61 **14 Claims**

1. A process for the identification of objects which appear at an image window in random positions and orientations and for random times and which have a data field containing contrasting indicia in at least one data track and at least one predetermined contrasting line pattern (PIC-pattern) which indicates the position and orientation of the data track(s) and contains several lines of predetermined spacing and/or line width, which data track is opto-electronically scanned at the image window in at least one row and column organized point raster (X_i, Y_j i=1 . . . n, j=1 . . . m) and at each raster point (X_i, Y_j) video raster point signals V_{ij} are produced corresponding to the light/dark values of the scanned image points, whereupon the video raster point signals are assembled in a predetermined sequence to form a videosignal, and the position and orientation of the data track(s) relative to the image window is determined upon the appearance of a PIC contrasting sequence in the videosignal corresponding to the PIC pattern(s), whereupon the information contained in the videosignal is then decoded and the indicia in the data track(s) determined; and wherein:

(a) during each scanning of the point raster (X_i, Y_j) the video raster point signals V_{ij} corresponding to the original image are stored in a memory matrix made up of rows and columns;

(b) a search raster arranged in rows and columns (X_i, Y_j) is employed to scan and read the memory positions of the memory matrix once or several times and to produce a videosignal during each scan wherein the rows of the



search raster and of the memory matrix upon each scan of the search raster cross each other at a predetermined search angle α_k, k=1, 2, 3 . . . ;

(c) the output videosignal is examined for the presence/absence of the PIC—contrasting sequence;

(d) upon recognition of the PIC—contrasting sequence the angle β between the actual search direction (angle α_k) and the data track, as well as the position of the data field within the memory image is determined from the corresponding address coordinates of the search raster, and the direction of the data track(s) (reading angle $\rho=\beta+\alpha_k(\pm 90°)$) with the memory matrix is calculated;

(e) then the memory image is read and decoded with reading raster (X'_i, Y'_j) arranged in rows and columns in the direction of, or at right angles to, the data track, and

(f) the address coordinates of the search raster (x_i, y_j) are produced from a coordinate rotation of the address coordinates of the memory positions (X_i, Y_j) followed by an interpolation, by which the actual memory positions addresses of the memory image nearest to rotated address coordinates are selected.

4,691,368

FLEXIBLE BLOCK PACKAGING

Claude Roessiger, Wolfeboro, N.H., assignor to Ocor Products Corporation, Mirror Lake, N.H.

Filed Jun. 20, 1985, Ser. No. 746,978
Int. Cl.[4] B65D *33/16, 30/18*
U.S. Cl. 383—10 **4 Claims**

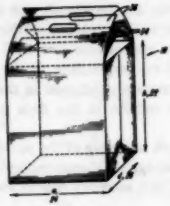
1. A flexible package for containing rectangular or square sided objects in a closely conforming relationship comprising:

a double layer of flexible material formed in a "U" shape with one layer forming an inner wall and the other layer forming an outer wall,

wherein the bottom of the "U" is tucked up between the two sides of the "U" to a distance equal to one half the desired depth of the finished package and the edges of the sides of the "U" are secured together, including the edges of the tucked up portion, to form a package open at its top end only, said edge sealed tucked in portion, when expanded

to surround the objects held in the package, forming a generally flat, rectilinear bottom portion,

integral upper portions of said inner wall extending beyond the upper ends of the combined height of the objects to be contained to form sealing flaps that can be folded across



the top portion of the finished package to enclose the top end of the package in said closely conforming relationship when it is fully loaded with the objects, and integral upper portions of said outer wall extending beyond the upper ends of said combined objects to form handles.

4,691,369

BAG WITH HANDLE AND METHOD OF MAKING THE SAME

Robert E. Costa, Middletown, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Filed Aug. 14, 1986, Ser. No. 896,233
Int. Cl.[4] B65D *33/06*
U.S. Cl. 383—17 **6 Claims**

1. An elongated handle for a bag, said handle being formed from a braided or woven fabric material and said handle having a soft, limp and flexible central hand gripping portion and stiffened end portions for securement to the bag, wherein said stiffened end portions are formed by sleeves encircling said handle at said end portions thereof.

4,691,370

RECLOSABLE BULK MATERIAL BAG WITH SLIDE FASTENER

Norman W. MacFee, Stanley, N.C., assignor to Talon, Inc., Meadville, Pa.

Filed Apr. 4, 1986, Ser. No. 848,227
Int. Cl.[4] B65D *33/26*
U.S. Cl. 383—61 **10 Claims**

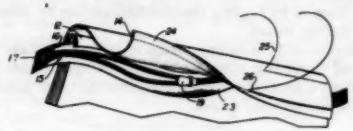
1. A reclosable bag comprising

a bag body having first and second opposing wall portions and a mouth,

an extension on the first wall portion of the bag body projecting somewhat beyond said mouth,

a closure flap on the first wall portion projecting a greater distance beyond said mouth and projecting beyond said extension,

a separable fastener having a first part secured to said extension and including a second part, the separable fastener,



said extension and closure flap being foldable as a unit across said mouth and into overlapping relationship with the exterior of the second wall portion of the bag body, and

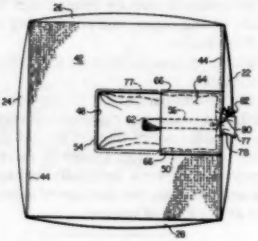
means attaching the second part of the separable fastener and said closure flap to the exterior of the second wall of the bag body, whereby said flap entirely covers and protects the separable fastener until the flap is released in the initial opening of the bag.

4,691,371

RECEPTACLE HAVING IMPROVED DISCHARGE SPOUT

Norwin C. Derby, Dallas, Tex., assignor to Super Sack Manufacturing Corporation, Dallas, Tex.

Filed Dec. 26, 1985, Ser. No. 813,407
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—62 **10 Claims**



1. A receptacle comprising:

an enclosure having a bottom wall for supporting materials contained by the receptacle;

a flexible discharge spout extending from an opening in the bottom wall of the enclosure;

a pocket mounted on the enclosure for securing the discharge spout across the opening in the bottom wall to prevent the contents of the receptacle from discharging through the opening the pocket having an aperature; and

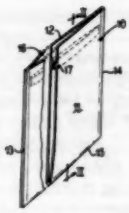
fastening means for securing the discharge spout within the pocket, the fastening means being secured to the discharge spout and extending through the aperture in the pocket.

4,691,372

MANUFACTURE OF MULTI-LAYERED RECLOSABLE BAG MAKING MATERIAL AND BAGS MADE THEREFROM

Donald L. Van Erden, Wildwood, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Aug. 5, 1986, Ser. No. 893,368
Int. Cl.⁴ B65D *33/16*
U.S. Cl. 383—63 **5 Claims**



1. A method of producing a multi-layered reclosable bag making material assembly comprising the steps of sequentially:

continuously coating over essentially the entire area of a moving continuous substrate layer, a continuous fluent layer of resin, and thereby directly laminating the resulting said resin layer to said substrate; and

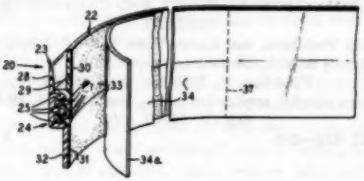
immediately thereafter, while said so-coated resin layer is still in an adhesive state on said substrate, continuously applying to said resin layer, a reclosable fastener strip means, and thereby solely by means of said still adhesive state resin layer directly bonding said fastener means to said resin layer.

4,691,373

ZIPPER CLOSURE WITH UNITARY ADHESIVE COVER SHEET

Steven Ausnit, New York, N.Y., assignor to Minigrip, Incorporated, Orangeburg, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,765
Int. Cl.⁴ B65D *33/16*
U.S. Cl. 383—63 **11 Claims**



1. Zipper closure for selective attachment along elongated openings in preexisting containers, comprising:

a zipper strip assembly having a pair of contiguous strip members carrying complementary manually interlockable and releasable zipper means which are interlocked so that the assembly can be handled as a unit, said strip members having respective attachment surfaces;

pressure sensitive adhesive on each of said attachment surfaces;

peelable cover sheet means bridging both strip members and engaged on said adhesive in a protecting relationship and adapted to be peelably stripped therefrom to expose said adhesive, so that one of said attachment surfaces can be applied and attached by means of the adhesive thereon to a first lip on a container along an elongated opening therein and the other of said attachment surfaces can be applied and attached by means of the adhesive thereon to a second lip along the opening, for adhesion of the attachment surfaces to the lips and thus providing a reclosable closure for the container at said elongated opening;

said peelable cover sheet means being a single unitary structure with one portion engaged on the adhesive on one of the attachment surfaces and another portion engaged on the adhesive on the other of said attachment surfaces so as to bridge between the strip members so that the strip members do not become separated and are retained together as a unit for handling without inadvertent separation of the strip members; and

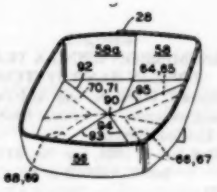
said adhesive having bonding strength and peel strength, with respect to the substrate of the container to which applied, greater than the manipulation strength normally applied for interlocking or releasing the zipper means after effecting attachment of the attachment surfaces to said lips by means of said adhesive.

4,691,374

COOKING BAG WITH DIAGONAL GUSSET SEALS

James D. Watkins, Prior Lake, and David W. Andreas, Minneapolis, both of Minn., assignors to Golden Valley Microwave Foods Inc., Edina, Minn.

Continuation of Ser. No. 522,268, Aug. 11, 1983, abandoned.
This application Feb. 19, 1985, Ser. No. 721,458
Int. Cl.⁴ B65D *30/16*
U.S. Cl. 383—104 **10 Claims**



1. A square end gusseted bag construction comprising a pair of opposing front and back rectangular face panels of the same length having parallel top and bottom edges and parallel side edges at right angles thereto,

left and right connecting gussets extending between the front and back panels of the bag, each having a pair of left and right gusset panels respectively adjacent each other and connected together by a gusset fold,

the gussets extending toward the center of the bag when the bag is in a flat condition and the gusset folds being close enough together when the bag is flat to separate the bag into a pair of connected tubes,

top and bottom seals extending across the bag from one side edge thereof to the other adjacent to the top and bottom edges of the bag,

permanent diagonal seals at the bottom of the bag to form a strong permanent seal,

the permanent diagonal seals comprising seals between the gussets and the face panels including a first pair of diagonal seals on the left side of the bag beginning at the center of the bag and being inclined laterally between each gusset panel and a portion of an adjacent face panel in contact therewith,

a second pair of diagonal seals beginning at the center of the bag and being inclined toward the right between each of the right gusset panels and an adjacent face panel,

a temporary seal dividing the bag into a plurality of interconnected communicating compartments comprising at least one transversely extending product locating seal defined by a transversely extending band of heating sealing adhesive to temporarily seal one face panel to adjacent gussets to initially hold the gussets in a tucked-in condition

adapted to hold a product in place on one side of said bag between said gussets,

said temporary seal being provided in the bag between at least one face panel and an adjacent portion of a gusset panel to seal at least one of the tubes transversely at a point located intermediate to the ends of the bag to separate at least one of the tubes into at least two separate connected compartments that communicate with one another between the gusset folds including a first compartment adapted to enclose said product and a second compartment,

said one face panel and said temporary seal being adapted to weaken when the bag and a product contained therein is heated to permit the gussets to pop out and thereby allow expansion of the bag and said product, said expansion enabling the product to shift from said one side of the bag to fill the entire bag, and

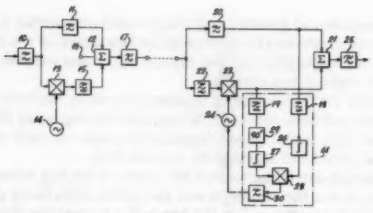
said permanent diagonal seals remaining intact after expansion of the bag to provide a sealed bag bottom free from confining corner folds within which if present portions of the product could otherwise become trapped.

4,691,375

DATA TRANSMISSION USING A TRANSPARENT TONE-IN BAND SYSTEM

Joseph P. McGeehan, Wiltshire, and Andrew Bateman, Avon, both of England, assignors to National Research Development Corporation, London, England

Filed Jun. 6, 1984, Ser. No. 617,733
Int. Cl.⁴ H04B 1/76
U.S. Cl. 455—71 **27 Claims**



10. A receiver for a communication system which employs a transmitter comprising frequency selection and translation means for dividing a band of interest in the frequency spectrum into upper and lower portions with at least one signal present at a significant level in both portions and for carrying out frequency translation, the output signal of the frequency selection and translation means having one said portion which is translated in frequency to provide a frequency notch between the lower and upper portions, the receiver comprising:

a receiver processor for restoring the original frequency spectrum,

means for deriving a correcting signal dependent upon any difference in frequency and phase in the said one signal in those parts of the restored spectrum derived from the lower and upper portions respectively, and

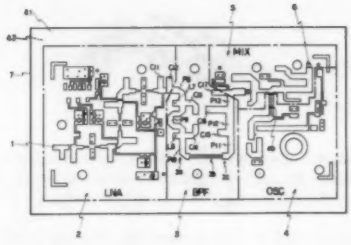
error-reduction means coupled to the said receiver processor for reducing any said frequency and phase difference in the output of the said receiver processor in accordance with the correcting signal.

4,691,376

FREQUENCY CONVERTER

Hiroshi Watanabe, Gyoda; Takashi Johzuka, Sakado, and Masanobu Suzuki, Nagareyama, all of Japan, assignors to New Japan Radio Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1985, Ser. No. 806,863
Claims priority, application Japan, Dec. 8, 1984, 59-259733
Int. Cl.⁴ H04B 1/26
U.S. Cl. 455—131 **4 Claims**



1. A frequency converter for use in a 4 GHz band comprising:

a printed circuit board provided in a shield case having at a first end an input terminal and at a second end an output terminal;

a printed circuit formed longitudinally on said board comprising, connected in sequence, a low noise amplifier connected to said input terminal, a band pass filter, and a mixer having connected thereto a local oscillator, said mixer being connected to said output terminal;

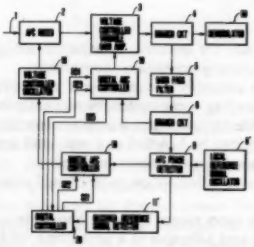
said band pass filter being formed of three portions on said printed circuit board substantially centrally thereon, comprising a first LC band pass portion formed transversely on said board, a second interdigitated band pass portion formed longitudinally on said board, and a third band rejection portion formed transversely on said board, said first, second and third portions being connected to each other in series in the direction of signal flow to form said band pass filter in a U-shape.

4,691,377

AUTOMATIC FREQUENCY AND GAIN CONTROL CIRCUIT

Masashi Yoshihara, and Kazuo Yano, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Sep. 17, 1985, Ser. No. 776,848
Claims priority, application Japan, Sep. 19, 1984, 59-196351
Int. Cl.⁴ H04B 1/16
U.S. Cl. 455—256 **3 Claims**



1. An automatic frequency and gain control circuit comprising:

an AFC mixer supplied with a received signal containing a

received reference signal and controlled by an output signal of a voltage controlled oscillator;

a voltage controlled variable gain amplifer for amplifying an output signal of said AFC mixer under the control of a gain control signal to send said amplified output signal thereof to a demodulator;

a bandpass filter for passing only said received reference signal among an output of said voltage controlled variable gain amplifier;

a branching means for branching the output of said bandpass filter into two portions;

a digital AGC control means being supplied with one portion of an output of said branching means for supplying said gain control signal to said voltage controlled variable gain amplifier such that an output level of said variable gain amplifier would be constant;

an AFC phase detector for detecting the phase difference between the phases of the other portion of the output of said branching means and a reference signal generated by a local reference signal oscillator;

a digital AFC control means supplied with an output of said AFC phase detector for controlling an oscillator frequency of said voltage controlled oscillator such that an output frequency of said AFC mixer would be constant; and

a received reference signal detector supplied with an output of said AFC phase detector for producing an output representing a presence of said received reference signal, and a digital controller supplied with an output of said received reference signal detector for supplying sampling clock signal to said digital AFC control means and to said digital AGC control means when there is said received reference signals;

said digital AGC control means including means for setting the gain control voltage supplied to said voltage controlled variable gain amplifier to a predetermined value when said received reference signal is not received, means for switching its own input from an output of said setting means to an output of said bandpass filter when said received reference signal starts to be received, and means for sampling an output of said bandpass filter by said sampling clock signal so long as said received reference signal is being received;

said digital AFC control means including means for setting an oscillation frequency of said voltage controlled oscillator to any desired value when said received reference signal is not received, means for switching its own input from an output of said oscillation frequency setting means to an output of said AFC phase detector when said received reference signal starts to be received, and means for sampling the output of said AFC phase detector by said sampling clock signal so long as said received reference signal is being received;

both of said digital AGC control means and said digital AFC control means respectively including means responsive to an interruption said sampling clock signal for holding the gain control voltage and the frequency control voltage at values sampled by a last pulse before a stopping of the sampling clock signal when said received reference signal is interrupted; and

either one or both of said digital AGC control means and said digital AFC control means including means for detecting the interruption of said received reference signal to send to said digital controller a signal that stops sending of said sampling clock signal.

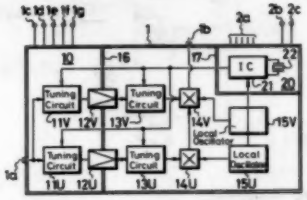
188-993 O.G.-87-18

4,691,378

TUNER FOR TELEVISION RECEIVER

Kenichiro Kumamoto, Tokyo; Akira Sato, Kanagawa; Koichi Ohya, Tokyo, and Koichi Matsuda, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,739
Claims priority, application Japan, Dec. 24, 1984, 59-272660
Int. Cl.[4] H04B *1/10, 1/08*
U.S. Cl. 455—301 **4 Claims**



1. A tuner for a television receiver comprising:

a substantially rectangular common shielding case having opposed elongated side walls connected by opposed end walls;

electronic tuning means within said case for selectively receiving one of a plurality of frequencies within a plurality of frequency bands and including a respective tuning circuit means and a respective local oscillator circuit for each said frequency band, each said tuning circuit means including varicap diode means;

phase locked loop channel selection means within said case for supplying a selected tuning voltage corresponding to the selected frequency to each of said tuning circuit means;

said channel selection means and said local oscillator circuits being located along a first line substantially parallel to and adjacent one of said end walls of said case with said channel selection means being at one end of said first line nearest to one of said side walls of said case;

a plurality of external connection terminals for setting said tuning means and said channel selection means to a desired condition, said connection terminals being located on said one side wall along a second line substantially perpendicular to said first line;

shielding plate means within said case having a first portion extending substantially perpendicularly from said one side wall at a connection point thereon and a second portion angularly bent from said first portion and extending to said one end wall between said channel selection means and the closest one of said local oscillator circuits for defining an isolated compartment in said case in which said channel selection means is enclosed in separation from said tuning means;

a high frequency input terminal and an intermediate frequency output terminal located on respective walls of said case outside of said compartment; and

a channel selection terminal for receiving a channel selection control digital signal located on said one side wall of said case along said second line inside of said compartment.

4,691,379

MIXER CIRCUIT

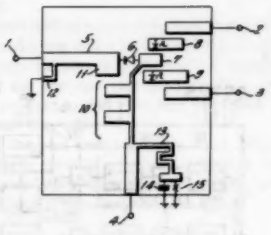
Yasumichi Shizume, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 3, 1986, Ser. No. 825,235

Claims priority, application Japan, Feb. 1, 1985, 60-18298; May 20, 1985, 60-108643

Int. Cl.[4] H04B 1/26

U.S. Cl. 455—319 12 Claims



1. A mixer comprising:

first line means having a first end for receiving an input radio frequency signal;

first and second terminals for receiving first and second local oscillation signals having different frequencies;

a mixer diode having first and second terminals, one of said terminals of said mixer diode being coupled to a second end of said first line means;

second line means coupled to said second terminal of said mixer diode, said second line means having a length which is approximately ¼ of the wavelength of said input radio frequency signal;

first and second coupling means for coupling said second line means, to said first and second terminals, respectively; and

third line means coupled to the junction of said second line means and said mixer diode for delivering an intermediate frequency signal.

4,691,380

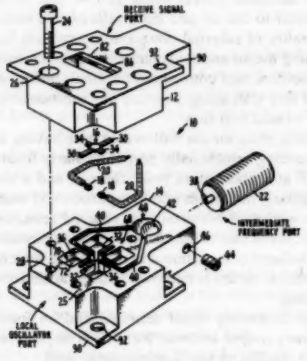
QUAD-RIDGE WAVEGUIDE MIXER

Wayne F. Westgate, Sunnyvale, Calif., assignor to Avantek, Inc., Santa Clara, Calif.

Filed May 5, 1986, Ser. No. 859,617

Int. Cl.[4] H04B 1/26

U.S. Cl. 455—328 21 Claims



1. A mixer responsive to a receive signal and a local oscillator signal for generating an intermediate frequency signal equal to a product of the receive and local oscillator signals, said mixer comprising:

a quad-ridge waveguide having four ridges protruding inwardly from the walls thereof, wherein the receive signal is applied to one pair of opposed ridges and the local oscillator signal is applied to the other pair of opposed ridges;

two capacitors each coupled at one terminal thereof to a separate ridge of a first pair of opposed ridges;

a diode ring including four diodes interconnected as a ring with each diode coupled between two of four junctions of said ring and with each junction connecting the anode of one diode to the cathode of an adjacent diode, wherein a first pair of opposed junctions of said diode ring is coupled through said capacitors to said first pair of opposed ridges, and wherein a second pair of opposed junctions of said diode ring is coupled to a second pair of opposed ridges; and

summing means coupled to said first pair of opposed junctions of said diode ring for providing the intermediate frequency signal.

4,691,381

RECEIVER FOR AMPLITUDE MODULATED SIGNALS

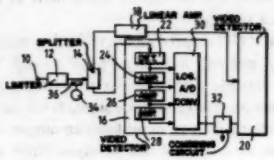
David R. Bollard, Mayfield, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,637

Claims priority, application United Kingdom, Apr. 30, 1984, 8411038

Int. Cl.[4] H04B 1/16

U.S. Cl. 455—334 9 Claims



1. In a receiver for detecting an amplitude modulated signal received at the input thereof and producing a digital output having a digital value corresponding to the amplitude of the detected input signal on a logarithmic scale, a video detector comprising:

a detector stage coupled to the input of said receiver for detecting the received amplitude modulated input signal;

a cascaded chain of amplifiers connected to the output of the detector stage for receiving the detected input signal, said amplifiers respectively having gains which quantize the dynamic range of the amplitude of the detected signal in logarithmic steps;

a plurality of groups of comparators having first inputs and second groups, the first inputs of the comparators in respective groups being respectively connected to the output of the detector stage and to outputs of respective ones of said amplifiers;

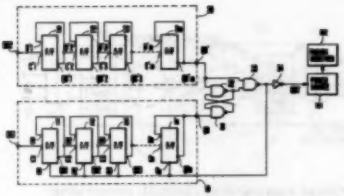
and a plurality of logarithmically stepped resistive voltage divider chains respectively corresponding to respective ones of said groups of comparators and each having taps thereon respectively connected to the second inputs of respective comparators in the corresponding group, such taps supplying logarithmically quantized reference voltages to the comparators connected thereto, all of said voltage divider chains and the steps thereon being substantially the same.

4,691,382

BATTERY SAVING SIGNAL GENERATING CIRCUIT

Takeshi Nakajima, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 31, 1984, Ser. No. 687,645
Claims priority, application Japan, Jan. 9, 1984, 59-1605
Int. Cl.[4] H04B *1/16*; H03K *3/01, 3/017*; G01R *29/02*
U.S. Cl. 455—343 8 Claims



1. A battery saving signal generating circuit comprising means for producing time slot pulses for energizing a power source assembled in a paging receiver;

said time slot pulse generating means comprising:

first means for producing a first timing signal for determination of a time duration of each of said time slot pulses;

second means operable independent of said first means for producing a second timing signal for determination of an occurrence interval between said adjacent time slot pulses; and

third means responsive to said first and second timing signals for producing said time slot pulses;

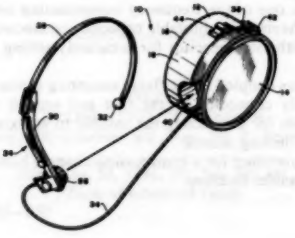
whereby a driving power is supplied from said power source to said paging receiver when the time slot pulse is activated, and the driving power is not supplied to said paging receiver when the time slot pulse is inactivated.

4,691,383

COMPACT RADIO

Robert A. DeMars, 7932 Maestro, Canoga Park, Calif. 91304

Filed May 13, 1986, Ser. No. 862,790
Int. Cl.[4] H04B *1/08*
U.S. Cl. 455—351 10 Claims



1. A compact radio comprising:

(a) a disk-like housing defined by two major, parallel surfaces separated by a cylindrical body, with an attachment means provided on at least one of said major surfaces for attaching said radio to the body of a listener;

(b) electronic means within said housing for detecting and amplifying a radio signal;

(c) an earphone assembly provided with means for conveying said amplified radio signal to an ear of said listener, said earphone assembly comprising a speaker adapted to be received in said ear, an adjustable head band for partially encircling the head of the listener, with means provided on one end thereof for supporting said speaker, and a wire for conveying said amplified signal to said speaker;

(d) means cooperatively associated in said cylindrical body for storing said wire;

(e) means cooperatively associated in said cylindrical body for storing at least a portion of said earphone assembly; and

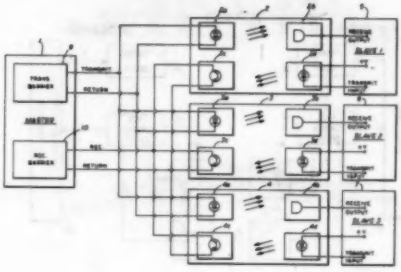
(f) means in said cylindrical body for adjusting the volume of said amplified signal.

4,691,384

INTRINSICALLY SAFE MULTI-DROP COMMUNICATIONS LINK

Tommy L. Jobe, Noble, Okla., assignor to Technical Oil Tools Corporation, Norman, Okla.

Filed Oct. 2, 1985, Ser. No. 782,888
Int. Cl.[4] H03H *5/12*
U.S. Cl. 455—602 12 Claims



4. An intrinsically safe multi-drop communications link comprising a master having an output and an input means and a plurality of slaves, the slaves being in parallel; a transmit line extending from the master output means toward each slave; a receive line extending from each slave toward the master input means; a first shunt-diode safety barrier circuit in the master output means and a second shunt-diode safety barrier circuit in the master input means; and an opto-coupler interface at each slave communicating between each slave and the transmit and receive lines extending thereto, the opto-coupler interface comprising emitter-detector pairs spaced apart by an intrinsically safe distance whereby intrinsically unsafe fault conditions cannot occur.

4,691,385

OPTICAL COMMUNICATION APPARATUS FOR A VEHICLE

David J. Tupman, Mentor, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Sep. 5, 1985, Ser. No. 773,141
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—607 6 Claims

1. Communication apparatus for controllably bidirectionally transferring information between a vehicle and a docking station, comprising:

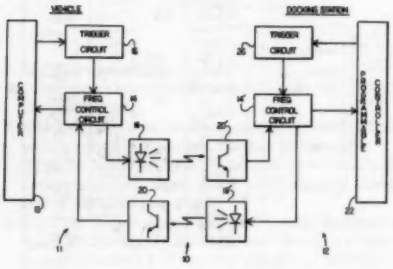
first and second radiant energy emitting means for producing pulsed radiant energy in response to receiving respective pulse control signals, one of said first and second radiant energy emitting means being located on said vehicle and the other on said docking station;

first and second radiant energy detecting means for producing electrical signals responsive to received radiant energy, one of said first and second radiant energy detecting means being located on said vehicle and the other on said docking station;

first frequency control means for receiving said electrical signals from said one of said first and second radiant en-

ergy detecting means located on said vehicle, producing pulse control signals having a nominal frequency which is variable within a predetermined frequency range, controllably delivering said produced pulse control signals at said nominal frequency to said one of said first and second radiant energy emitting means located on said vehicle in the absence of receiving said electrical signals, and automatically adaptively modifying the frequency of said respective produced pulse control signals in response to receiving said electrical signals;

second frequency control means for receiving said electrical signals from said one of said first and second radiant energy detecting means located on said docking station, producing pulse control signals having a nominal frequency which is variable within a predetermined frequency range, controllably delivering said produced pulse control signals at said nominal frequency to said one of said first and second radiant energy emitting means located on said docking station in the absence of receiving said electrical signals, and automatically adaptively modifying the frequency of said respective produced pulse control signals in response to receiving said electrical signals; and



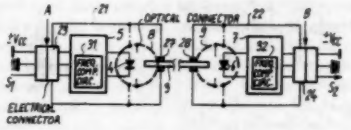
wherein said vehicle includes first trigger means for controllably delivering a transmit trigger signal to said first frequency control means in response to predetermined status conditions of said vehicle, said docking station includes second trigger means for controllably delivering a transmit trigger signal to said second frequency control means in respose to predetermined status conditions of said docking station, and each of said first and second frequency control means include logic means for receiving said respective transmit trigger signal and blocking delivery of said respective pulse control signals to said respective one of said first and second radiant energy emitting means in response to the absence of said transmit trigger signal.

4,691,386

OPTICAL TRANSMISSION CHANNEL WITH ELECTRICAL CONNECTORS

Gregoire Eumurian, Argenteuil, and Albert Courty, Ville D'Avray, both of France, assignors to Thomson-CSF, Paris, France

Filed Nov. 28, 1984, Ser. No. 675,799
Claims priority, application France, Dec. 2, 1983, 83 19320
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—607 **10 Claims**



1. An optical transmission channel, comprising:

an optical cable having at least two optical fibers;

first and second modules connected to respective first and second ends of the optical cable, each of the modules having;

(a) a housing;

(b) means coupled to the housing for clamping a sheath of the optical cable in a fixed position to one end of the module;

(c) means for fixing photoemitting and photoreceiving diodes within the housing;

(d) first means for fixedly coupling an end of the first of the at least two optical fibers to the photoemitting diode, the photoemitting diode being connected to a first electronic circuit;

(e) second means for fixedly coupling the second of the at least two optical fibers to the photoreceiving diode, the photoreceiving diode being connected to a second electronic circuit;

(f) means for fixedly mounting the first and second electronic circuits within the housing; each of the first and second electronic circuits including a frequency compensating circuit for producing a phase lead to accentuate high frequencies attenuated by the optical cable and to permit operations in a widened frequency band, each of the frequency compensating circuits comprising in series a resistor, a capacitor and an impedance element of impedance determined with respect to a length of the cable, one of the frequency compensating circuits further having an adjustable capacitor connected in parallel with said capacitor for accurately setting the phase lead;

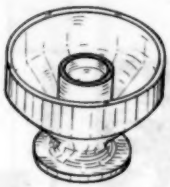
(g) means coupled to the fixing mounting means and electrically connected to the first and second electronic circuits for connecting the module to an external electrical linking means;

thereby providing for a transmission channel having a constant transfer function.

DESIGNS

SEPTEMBER 1, 1987

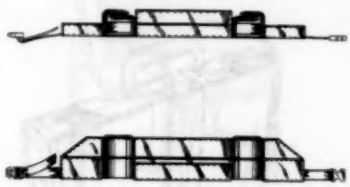
291,620
ICE CREAM CONE HOLDER
Emanuel Porchia, 423 West 5th, Eldorado, Ark. 71731
Filed Nov. 5, 1984, Ser. No. 668,209
Term of patent 14 years
U.S. Cl. D1—105



291,621
FOOT PROTECTOR
Pinky Herman, 4705 NW. 35th St., Lauderdale Lakes, Fla. 33319
Filed Sep. 1, 1987, Ser. No. 695,690
Term of patent 14 years
U.S. Cl. D2—271

291,622
DECORATIVE TOE COVER
Bonnie Gray, 400 Cranbury Rd., Apt. #4, E. Brunswick, N.J. 08816
Filed Aug. 13, 1984, Ser. No. 639,716
Term of patent 14 years
U.S. Cl. D2—330

291,623
INSULATED BELT CARRIER FOR BEVERAGE CANS
Craig A. Ericksen, 9940 Ammons Cir., Broomfield, Colo. 80020
Filed Mar. 27, 1985, Ser. No. 716,625
Term of patent 14 years
U.S. Cl. D2—630



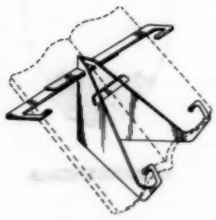
291,624
ATTACHE CASE OR SIMILAR ARTICLE
Walter Binlo, New Rochelle, N.Y., assignor to Ventura Travelware, Inc., Long Island City, N.Y.
Filed Mar. 1, 1985, Ser. No. 707,134
Term of patent 14 years
U.S. Cl. D3—76

291,625
ATTACHE CASE OR SIMILAR ARTICLE
Walter Bialo, New Rochelle, N.Y., assignor to Ventura Travelware, Inc., Long Island City, N.Y.
Filed Apr. 12, 1985, Ser. No. 723,495
Term of patent 14 years
U.S. Cl. D3—76

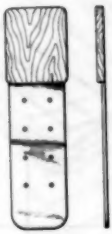
291,626
SHEATH
Walter W. Collins, North, S.C., assignor to Gerber Legendary Blades, Inc., Portland, Oreg.
Filed Jan. 18, 1985, Ser. No. 692,531
Term of patent 14 years
U.S. Cl. D3—102

291,627
KNIFE POUCH
Walter W. Collins, North, S.C., assignor to Gerber Legendary Blades, Inc., Portland, Oreg.
Filed Jan. 18, 1985, Ser. No. 692,534
Term of patent 14 years
U.S. Cl. D3—102

291,628
BOOK HOLDER
Lillian Poltere, 5733 Lord Cecil St., San Diego, Calif. 92122
Filed Feb. 11, 1985, Ser. No. 700,272
Term of patent 14 years
U.S. Cl. D6—310



291,629
BELT BUCKLE RACK
Walter R. Belden, 300 E. Prosser Rd., #25A, Cheyenne, Wyo. 82007
Filed Jan. 4, 1985, Ser. No. 688,971
Term of patent 14 years
U.S. Cl. D6—316

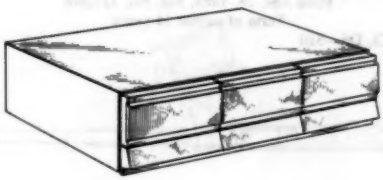


291,630
HOOK FIXTURE
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Jan. 4, 1985, Ser. No. 689,083
Term of patent 14 years
U.S. Cl. D6—323

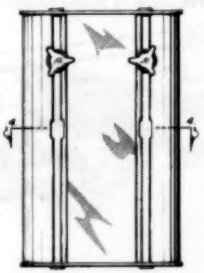
291,631
CHAIR
Peter de Boer, Pr.Margrietplantsoen 45, 1403 SV Bussum, Netherlands
Filed Dec. 19, 1984, Ser. No. 683,618
Claims priority, application Belgium, Jun. 22, 1984, 59102-01
Term of patent 14 years
U.S. Cl. D6—366

291,632
SEAT
Colman Zola, 58 Tamarack Way, Pleasantville, N.Y. 10570
Filed Sep. 28, 1984, Ser. No. 655,518
Term of patent 14 years
U.S. Cl. D6—379

291,633
CASSETTE STORAGE CASE
Richard Merzon, 49-16 Maspeth Ave., Maspeth, N.Y. 11378
Filed Apr. 19, 1985, Ser. No. 725,108
Term of patent 14 years
U.S. Cl. D6—446



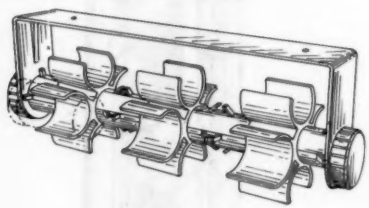
291,634
FURNITURE SUPPORT STRUT
Raphael Ueros, Cerritos, Calif., assignor to Environmental Production Systems Company, Irvine, Calif.
Filed Mar. 14, 1985, Ser. No. 711,622
Term of patent 14 years
U.S. Cl. D6—491



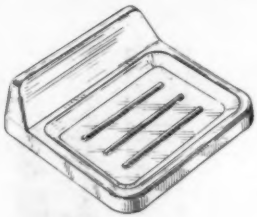
291,635
PORTABLE TRAY FOR ATTACHMENT TO A BEACH UMBRELLA
Benjamin Dickman, 1336 Knorr St., Philadelphia, Pa. 19111
Filed May 28, 1985, Ser. No. 737,784
Term of patent 14 years
U.S. Cl. D6—509

291,636
DRAWER SLIDE
Robert Rechberg, Orange, Calif., assignor to Actron Mfg., Inc., Anaheim, Calif.
Filed Apr. 25, 1985, Ser. No. 727,096
Term of patent 14 years
U.S. Cl. D6—510

291,637
SPICE RACK
Ralph R. Burin, Woodridge, Ill., assignor to Wilton Enterprises, Inc., Woodridge, Ill.
Filed Jun. 3, 1985, Ser. No. 740,863
Term of patent 14 years
U.S. Cl. D6—514



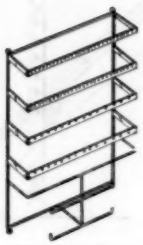
291,638
SOAP DISH
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Jan. 4, 1985, Ser. No. 689,080
Term of patent 14 years
U.S. Cl. D6—540



291,639
TOWEL BAR
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Jan. 4, 1985, Ser. No. 689,081
Term of patent 14 years
U.S. Cl. D6—549

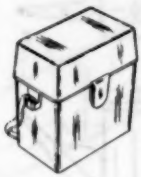
291,640
TOOL CADDY
Ralph M. Russo, 304 McNicoll Avenue, Willowdale, Ontario, Canada M2H 2C7
Filed Oct. 21, 1985, Ser. No. 789,974
Claims priority, application Canada, Sep. 23, 1985, 23-09-85-2
Term of patent 14 years
U.S. Cl. D6—563

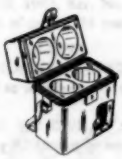
291,641
JEWELRY RACK
Mahin J. Farley, 8340 Greensboro Dr., McLean, Va. 22101
Filed Sep. 4, 1985, Ser. No. 772,438
Term of patent 14 years
U.S. Cl. D6—566



291,642
DOUBLE BASKET FRYER
Anthony F. Jerome, P.O. Box 428, Fairborn, Ohio 45324
Filed Jan. 9, 1986, Ser. No. 817,419
Term of patent 14 years
U.S. Cl. D7—43

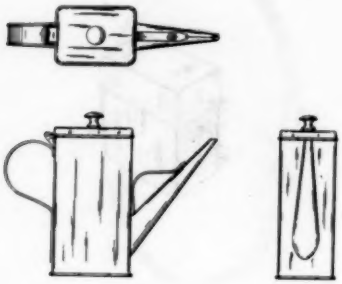
291,643
INSULATED CONTAINER
David L. Morris, Henderson, Ky., assignor to HTD, Inc., Henderson, Ky.
Filed Jun. 14, 1985, Ser. No. 744,626
Term of patent 14 years
U.S. Cl. D7—77



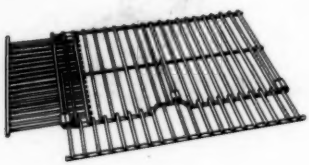


291,644
BREAD BOX
Gary A. Osborn, Rte. 6, Box 292A, Chatsworth, Ga. 30705
Filed Feb. 28, 1985, Ser. No. 706,665
Term of patent 14 years
U.S. Cl. D7—82

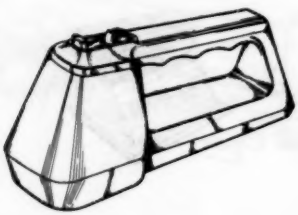
291,645
COOKING OIL CAN
Pasquale Bruno, Chicago, Ill., assignor to Amco Corporation, Chicago, Ill.
Filed Jul. 7, 1986, Ser. No. 882,693
Term of patent 14 years
U.S. Cl. D7—321



291,646
ADJUSTABLE COOKING GRID
Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.
Filed Dec. 16, 1985, Ser. No. 808,949
Term of patent 14 years
U.S. Cl. D7—332



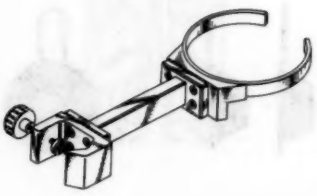
291,647
HAND MIXER HOUSING
Norman A. Steinkamp, La Grange Park, Ill., assignor to Sunbeam Corporation, Downers Grove, Ill.
Filed Mar. 21, 1985, Ser. No. 714,656
Term of patent 14 years
U.S. Cl. D7—379



291,648
BARBECUE STAND
Donald M. Pring, 117-11530 24 St., Edmonton, Alberta, Canada T5W4V3
Filed Jul. 23, 1984, Ser. No. 633,839
Term of patent 14 years
U.S. Cl. D7—403

291,649
VALVE SEAT DRIVER
David C. Rembold, Bloomington, Minn., assignor to Sunnen Products Company, St. Louis, Mo.
Filed Jun. 6, 1984, Ser. No. 617,673
Term of patent 14 years
U.S. Cl. D8—14

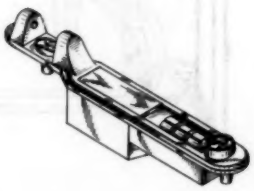
291,650
HOLDER RING FOR CARDIOTOMY RESERVOIR
Takashi Monzen, Tama, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 8, 1985, Ser. No. 699,589
Term of patent 14 years
U.S. Cl. D8—72



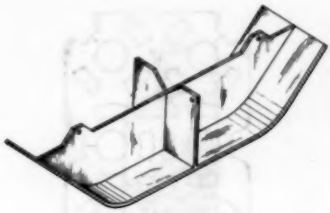
291,651
COUPON CLIPPER
William F. Sieg, 13-½ NE. Fifth St., Minneapolis, Minn. 55413, and Richard O. Bartz, 7017 Mark Terrace Dr., Edina, Minn. 55435
Filed Jul. 11, 1984, Ser. No. 629,885
Term of patent 14 years
U.S. Cl. D8—98

291,652
ZIPPER CLOSURE LOCK
Urs Gisiger, Gaensbruehlweg 4, 2545 Selzach, Switzerland
Filed Aug. 15, 1984, Ser. No. 641,039
Term of patent 14 years
U.S. Cl. D8—331

291,653
LUGGAGE LOCK
Walter Bialo, New Rochelle, N.Y., assignor to Ventura Travelware, Inc., Long Island City, N.Y.
Filed Apr. 10, 1985, Ser. No. 721,710
Term of patent 14 years
U.S. Cl. D8—331



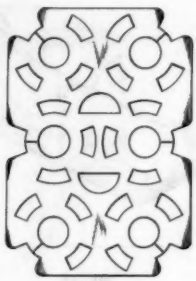
291,654
SLED FOR A REINFORCING CAGE OR THE LIKE
Thomas W. Foster, Jr., 3901 Shady Valley Dr., Arlington, Tex. 76013
Filed Jul. 15, 1985, Ser. No. 754,771
Term of patent 14 years
U.S. Cl. D8—349



291,655
SHELF BRACKET
Kenneth F. Motta, 176 Mahogany Dr., Naples, Fla. 33963
Filed Feb. 19, 1985, Ser. No. 702,900
Term of patent 14 years
U.S. Cl. D8—381

291,656
LOTION DISPENSING BOTTLE
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Continuation-in-part of Ser. No. 689,971, Jan. 9, 1985. This application May 28, 1985, Ser. No. 738,285
Term of patent 14 years
U.S. Cl. D9—300

291,657
INNER PACK BOTTLE CARRIER
Christopher Carr, and James J. Witt, Jr., both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 4, 1985, Ser. No. 707,940
Term of patent 14 years
U.S. Cl. D9—344



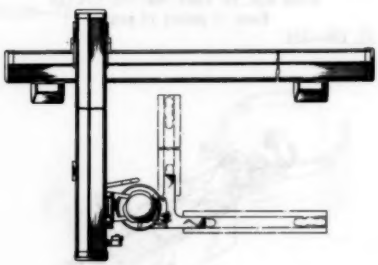
291,658
OIL CONTAINER
John T. Klette, Fairfax, Va.; Harry O. Smith, Huntington Beach, Calif., and Eugene C. Bruns, House Springs, Mo., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Apr. 24, 1985, Ser. No. 726,571
Term of patent 14 years
U.S. Cl. D9—352

291,659
COMMUNION CONTAINER
Lee V. Powell, Memphis, Tenn., assignor to Johnese W. Powell, Memphis, Tenn., a part interest
Filed May 31, 1985, Ser. No. 739,890
Term of patent 14 years
U.S. Cl. D9—341

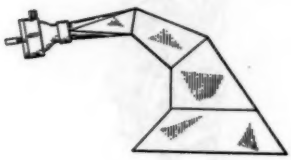
291,660
PERFUME BOTTLE
Oleg L. Cassini, 135 E. 19th St., New York, N.Y. 10003
Filed Sep. 12, 1984, Ser. No. 649,678
Term of patent 14 years
U.S. Cl. D9—384

291,661
CORNER FITTING FOR A STACKABLE CONTAINER
Soren Stange, Engelbrektsgatan 57, Goteborg, Sweden
Filed Aug. 8, 1984, Ser. No. 638,872
Claims priority, application Sweden, Feb. 8, 1984, 84-0386; Feb. 8, 1984, 84-0387
Term of patent 14 years
U.S. Cl. D9—499

291,662
TRACK TYPE DRAFTING MACHINE
Zoltan Goncze, Palmdale; Andrew M. Ogden, and Stanley Y. Kong, both of Pasadena, all of Calif., assignors to Vemco Corporation, San Dimas, Calif.
Filed Feb. 15, 1985, Ser. No. 702,340
Term of patent 14 years
U.S. Cl. D10—63



291,663
ACOUSTIC HORN
James D. Parsons, 5384 W. Fremont Pl., Littleton, Colo. 80123, and James J. Schwab, Chico, Calif., assignors to James D. Parsons, Littleton, Colo.
Filed Feb. 19, 1985, Ser. No. 703,100
Term of patent 14 years
U.S. Cl. D10—120



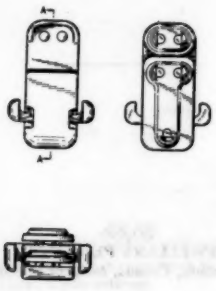
291,664
RING
Pepi G. Kelman, Beverly Hills, Calif., assignor to Pepi Kelman, Inc., Los Angeles, Calif.
Filed Sep. 30, 1985, Ser. No. 781,347
Term of patent 14 years
U.S. Cl. D11—27

291,665
PENDANT
Varouj Tabakian, Mississanga, Canada, assignor to Jewellery by Varouj Inc., Toronto, Canada
Filed Sep. 17, 1985, Ser. No. 776,908
Claims priority, application Canada, Apr. 3, 1985, 03-04-85-7
Term of patent 14 years
U.S. Cl. D11—83

291,666
JEWELLERY PENDANT
Claude Gozlan, Toronto, Canada, assignor to Direct Jewellery Inc., Canada
Filed Feb. 11, 1985, Ser. No. 700,086
Claims priority, application Canada, Dec. 14, 1984, 14-12-84-7
Term of patent 14 years
U.S. Cl. D11—84

291,667
WATERING ATTACHMENT FOR FLOWER POTS OR THE LIKE
Jack M. A. Wouters, 89 Crescent Ave., St. Thomas, Ontario, Canada N5P 2K4
Filed Apr. 3, 1986, Ser. No. 847,829
Term of patent 14 years
U.S. Cl. D11—164

291,668
BUCKLE
Kazumi Kasai, 3105-1, Kamikoizumi, Namerikawa-shi, Toyama-ken, Japan
Filed Apr. 5, 1985, Ser. No. 720,343
Claims priority, application Japan, May 7, 1984, D59-18612
Term of patent 14 years
U.S. Cl. D11—216

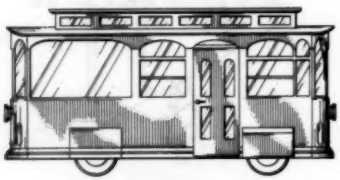


291,669
SLIDER FOR SLIDE FASTENER
Kiyoshi Oda, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Apr. 5, 1985, Ser. No. 720,278
Term of patent 14 years
U.S. Cl. D11—221

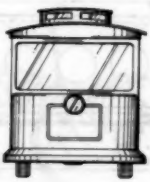
291,670
SLIDER FOR SLIDE FASTENER
Hideo Takabatake, Namerikawa, Japan, assignor to Yoshida Kogyo, K. K., Tokyo, Japan
Filed Apr. 5, 1985, Ser. No. 720,279
Claims priority, application Japan,
Term of patent 14 years
U.S. Cl. D11—221

291,671
SLIDER FOR SLIDE FASTENER
Kelichi Keyaki, Kurobe, Japan, assignor to Yoshida Kogyo, K. K., Tokyo, Japan
Filed Apr. 5, 1985, Ser. No. 720,280
Term of patent 14 years
U.S. Cl. D11—221

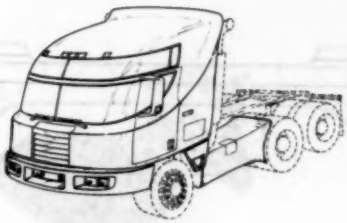
291,672
PASSENGER CARRYING VEHICLE
Richard B. McFadden, P.O. Box 3609, Deland, Fla. 32723
Filed Aug. 19, 1985, Ser. No. 767,101
Term of patent 14 years
U.S. Cl. D12—84



291,673
PASSENGER CARRYING VEHICLE
Richard B. McFadden, P.O. Box 3609, Deland, Fla. 32723
Filed Aug. 19, 1985, Ser. No. 767,117
Term of patent 14 years
U.S. Cl. D12—84

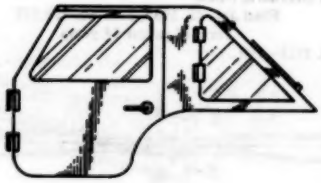


291,674
TRUCK CAB
Robert E. Smith, Orem, Utah, assignor to Pegasus Truck Cab Conversions, Inc., Orem, Utah
Filed May 21, 1985, Ser. No. 736,641
Term of patent 14 years
U.S. Cl. D12—96



291,675
TIRE
Ernst Mader, Munich, Fed. Rep. of Germany, assignor to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany
Filed Sep. 28, 1984, Ser. No. 655,866
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, MR 13822
Term of patent 14 years
U.S. Cl. D12—136

291,676
REMOVABLE VEHICLE TOP
Charles E. Noble, P.O. Box 112, Minnie, Ky. 41651
Filed Feb. 21, 1985, Ser. No. 703,868
Term of patent 14 years
U.S. Cl. D12—156

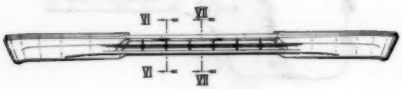


291,677
STATION WAGON REAR BUMPER
Ramon L. Everts, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 25, 1985, Ser. No. 759,577
Term of patent 14 years
U.S. Cl. D12—169

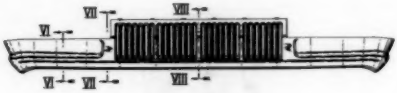
291,678
AUTOMOBILE FRONT BUMPER
Ramon L. Everts, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 26, 1985, Ser. No. 759,620
Term of patent 14 years
U.S. Cl. D12—169

291,679
AUTOMOBILE REAR BUMPER
Ramon L. Everts, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 26, 1985, Ser. No. 759,619
Term of patent 14 years
U.S. Cl. D12—169

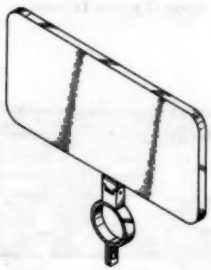
291,680
AUTOMOBILE VALANCE PANEL
Ramon L. Everts, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 25, 1985, Ser. No. 759,578
Term of patent 14 years
U.S. Cl. D12—190



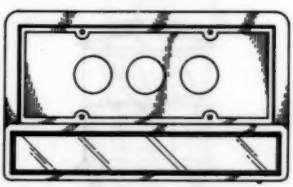
291,681
AUTOMOBILE VALANCE PANEL
Ramon L. Everts, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Jul. 25, 1985, Ser. No. 759,617
Term of patent 14 years
U.S. Cl. D12—190



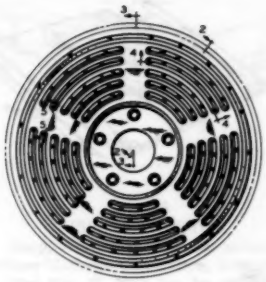
291,682
SUN DEFLECTOR FOR MOUNTING TO A VEHICLE INTERIOR REAR VIEW MIRROR
Stephen R. Stone, P.O. Box 818, 160 Tom Hickman, Malakoff, Tex. 75148
Filed Jan. 24, 1985, Ser. No. 694,271
Term of patent 14 years
U.S. Cl. D12—191



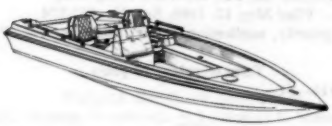
291,683
LICENSE PLATE FRAME
James C. Yates, 1091 NE. Sunrise La., Hillsboro, Oreg. 97123
Filed Apr. 22, 1985, Ser. No. 725,784
Term of patent 14 years
U.S. Cl. D12—193



291,684
VEHICLE WHEEL CENTER
Donald J. Reid, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Aug. 12, 1985, Ser. No. 764,825
Term of patent 14 years
U.S. Cl. D12—209



291,685
BOAT
Forrest L. Wood, Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, and Gary L. Wilson, both of Bull Shoals, all of Ark., assignors to Wood Manufacturing Company, Inc., Flippin, Ark.
Filed Aug. 9, 1985, Ser. No. 763,964
Term of patent 14 years
U.S. Cl. D12—314

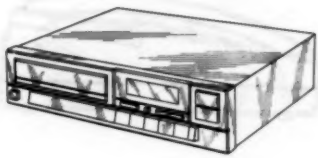


291,686
BOAT
Henry S. Wolfe, 14480 62nd St. North, Clearwater, Fla. 33520
Filed Oct. 21, 1985, Ser. No. 789,654
Term of patent 14 years
U.S. Cl. D12—316

291,687
BOAT
Henry S. Wolfe, 14480 62nd St. North, Clearwater, Fla. 33520
Filed Oct. 23, 1985, Ser. No. 790,365
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—316

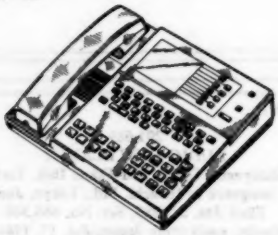
291,688
BOAT
Henry S. Wolfe, 14480 62nd St. North, Clearwater, Fla. 33520
Filed Oct. 23, 1985, Ser. No. 790,474
Term of patent 14 years
U.S. Cl. D12—316

291,689
AUDIO DISC PLAYER
Kazuhiko Nishiyama, Tokyo, and Takao Itoh, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 3, 1985, Ser. No. 688,508
Claims priority, application Japan, Jul. 17, 1984, 59-29520
Term of patent 14 years
U.S. Cl. D14—1

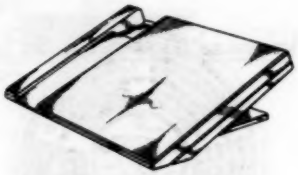


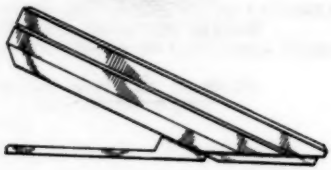
291,690
HEADPHONE
Joel B. Tabachnik, New York, N.Y., assignor to Talbot Toys Ltd., Kowloon, Hong Kong
Filed Mar. 4, 1985, Ser. No. 707,781
Term of patent 14 years
U.S. Cl. D14—36

291,691
COMBINED HANDSET AND STAND TELEPHONE UNIT
Hansruedi Fellmann, Dietlikon, Switzerland, assignor to Autophon AG, Switzerland
Filed Apr. 24, 1985, Ser. No. 726,801
Term of patent 14 years
U.S. Cl. D14—58

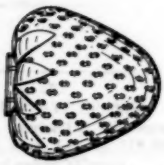


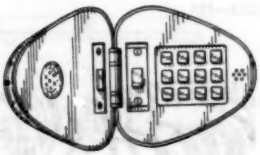
291,692
STAND FOR A TELEPHONE HANDSET
Clifford D. Read, Almonte, and Michael K. Eldershaw, Nepean, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Jun. 28, 1985, Ser. No. 750,086
Claims priority, application Canada, Jan. 23, 1985, 2301854
Term of patent 14 years
U.S. Cl. D14—60



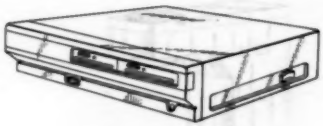


291,693
HANDSET TELEPHONE
Takei Yoshiharu, New Territories, Hong Kong, assignor to Tasca International Ltd, Kowloon, Hong Kong
Filed May 12, 1986, Ser. No. 862,574
Claims priority, application United Kingdom, Feb. 7, 1986, 1032115
Term of patent 14 years
U.S. Cl. D14—64





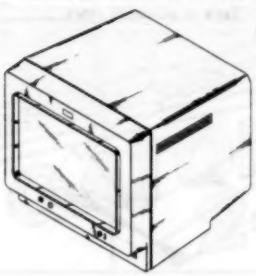
291,694
PERSONAL COMPUTER
Akira Aihara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 21, 1984, Ser. No. 684,795
Claims priority, application Japan, Jul. 6, 1984, 59-28028
Term of patent 14 years
U.S. Cl. D14—100



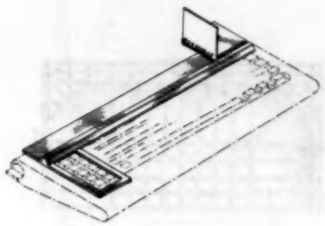
291,695
DISPLAY MONITOR
Michael H. Sharp, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 27, 1984, Ser. No. 676,024
Claims priority, application United Kingdom, May 30, 1984, 1019971
Term of patent 14 years
U.S. Cl. D14—113

MONITOR
FRONT VIEW

291,696
VISUAL DISPLAY MONITOR
David L. Schaum, Woodstock, N.Y.; Robert E. Steinbugler, and Jonathan J. Vitello, both of Raleigh, N.C., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Mar. 1, 1985, Ser. No. 705,807
Term of patent 14 years
U.S. Cl. D14—113

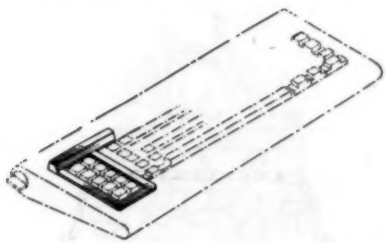


291,697
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to TDA, Inc., Redmond, Wash.
Filed Dec. 14, 1984, Ser. No. 683,130
Term of patent 14 years
U.S. Cl. D14—114

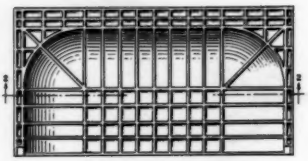


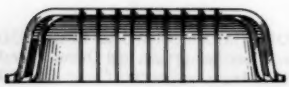
291,698
MEMORY CARD FOR WORD PROCESSOR
Junji Hirooka, Higashimurayama, and Osamu Murakami, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 28, 1985, Ser. No. 717,167
Claims priority, application Japan, Sep. 14, 1984, 59-38322
Term of patent 14 years
U.S. Cl. D14—114

291,699
PERSONAL COMPUTER KEYBOARD TEMPLATE FOR DISPLAYING OPERATING INSTRUCTIONS FOR SOFTWARE PROGRAM
Thorvald E. Duffin, II, Reston, Va., assignor to TDA, Inc., Redmond, Wash.
Filed Jul. 9, 1985, Ser. No. 753,096
Term of patent 14 years
U.S. Cl. D14—114

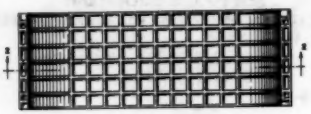


291,700
MOLD TO BE USED IN THE MANUFACTURE OF CONCRETE CEILINGS
Moshe Farhi, 4a Givat Downs St., Haifa, Israel
Continuation of Ser. No. 513,394, Jul. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 175,418, Aug. 5, 1980, abandoned. This application Jul. 7, 1986, Ser. No. 882,712
Claims priority, application Israel, Feb. 28, 1980, 8060
Term of patent 14 years
U.S. Cl. D15—136

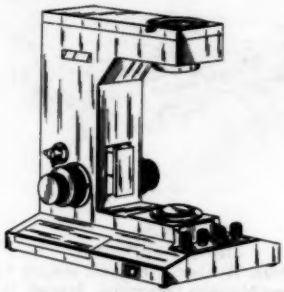




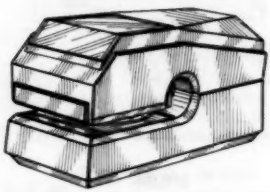
291,701
INNER SURFACE OF A MOLD TO BE USED IN THE MANUFACTURE OF CONCRETE CEILINGS
Moshe Farhi, 4a Givat Downs St., Haifa, Israel
Continuation of Ser. No. 513,395, Jul. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 175,417, Aug. 5, 1980, abandoned. This application Jul. 7, 1986, Ser. No. 882,713
Claims priority, application Israel, Feb. 28, 1980, 8067
Term of patent 14 years
U.S. Cl. D15—136



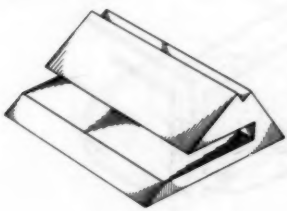
291,702
MICROSCOPE STAND WITH A BUILT-IN ILLUMINATOR
Robert M. Kahute, Honeoye Falls, N.Y., assignor to Warner-Lambert Technologies, Inc., Southbridge, Mass.
Filed Apr. 9, 1984, Ser. No. 598,108
Term of patent 14 years
U.S. Cl. D16—131



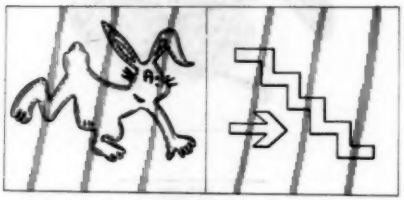
291,703
SEAL PRESS
Cameron Fink; Robert W. Schram, and Anthony Gentile, all of London, Canada, assignors to Sterling Marking Products Inc., London, Canada
Filed May 6, 1985, Ser. No. 730,909
Claims priority, application Canada, Jan. 21, 1985, 21-01-85-2
Term of patent 14 years
U.S. Cl. D18—15



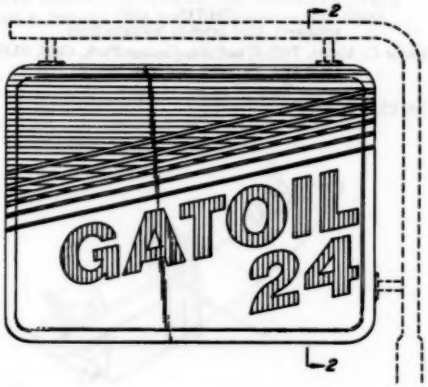
291,704
COMBINED MEMO PAD AND PEN HOLDER
Richard G. Zucker, New York, N.Y., assignor to Jonathan Bradley Pens, Inc., New York, N.Y.
Filed Oct. 29, 1984, Ser. No. 665,650
Term of patent 14 years
U.S. Cl. D19—78



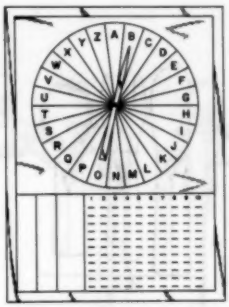
291,705
ESCAPE SYMBOL
Robert N. Hellmer, 538 New York Ave., Dunedin, Fla. 33528, and Robert J. Smallwood, 7250 Bandera Rd., San Antonio, Tex. 78238
Division of Ser. No. 549,390, Nov. 7, 1983, Pat. No. Des. 287,514. This application Feb. 11, 1986, Ser. No. 828,376
Term of patent 14 years
U.S. Cl. D20—30



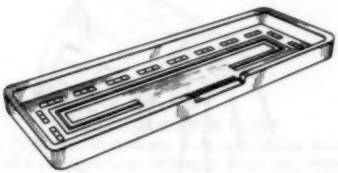
291,706
SIGN
Calame G. C. Georges, 32 av Frontenex, 1207 Genève, Switzerland; Jörg Zintzmeyer, and Peter G. C. Lux, both of Attenhoferstrasse 43, Zurich, Switzerland (CH-8032)
Filed Dec. 6, 1983, Ser. No. 558,649
Claims priority, application Switzerland, Jun. 6, 1983, 113107
Term of patent 14 years
U.S. Cl. D20—42



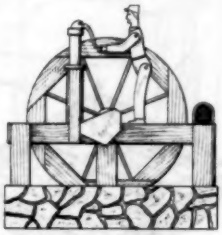
291,707
GAMEBOARD
Lois I. Martin, 1503 N. Windsor Dr., 103 Apartment, Arlington Hts., Ill. 60004
Filed Sep. 20, 1984, Ser. No. 652,138
Term of patent 14 years
U.S. Cl. D21—22



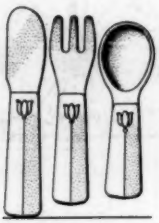
291,708
GAMING TABLE TOP
Robert F. Ollington, 129 Nelson Road, South Melbourne, Australia
Filed Jun. 25, 1984, Ser. No. 624,226
Claims priority, application Australia, Jan. 19, 1984, 6303/84
Term of patent 14 years
U.S. Cl. D21—37



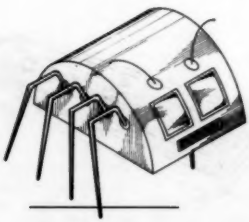
291,709
TOY WATER WHEEL
Troy B. Davis, Rte. 5, Box 295-A, Oxford, Miss. 38655
Filed Mar. 11, 1985, Ser. No. 710,074
Term of patent 14 years
U.S. Cl. D21—59



291,710
TOY TABLEWARE UTENSIL
James F. Mariol, 481 Dean View Dr., Cincinnati, Ohio 45224
Filed Jan. 16, 1985, Ser. No. 692,296
Term of patent 14 years
U.S. Cl. D21—121

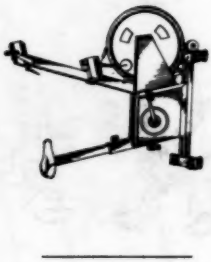


291,711
SPIDER MACHINE TOY
Robert Dixon, 3538 Kirby Rd., Memphis, Tenn. 38115
Filed Aug. 16, 1984, Ser. No. 641,469
Term of patent 14 years
U.S. Cl. D21—185

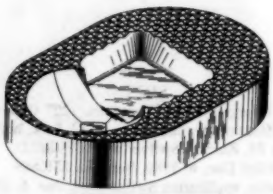


291,712
TRAMPOLINE
Mark Koivisto, 2230 Ridge Dr. #32, St. Louis Park, Minn. 55416
Filed Sep. 12, 1984, Ser. No. 649,755
Term of patent 14 years
U.S. Cl. D21—191

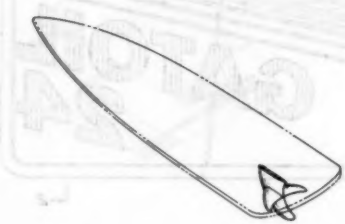
291,713
ERGOMETER
Heikki Kiiski, Turku 10, Finland, assignor to Tunturipyora OY, Truku, Finland
Filed Feb. 20, 1985, Ser. No. 703,408
Claims priority, application Finland, Sep. 4, 1984, 850/84
Term of patent 14 years
U.S. Cl. D21—195



291,714
KICKING TEE
H. Jay Spiegel, Alexandria, Va., assignor to Premium Products, Inc., Alexandria, Va.
Filed Apr. 24, 1985, Ser. No. 726,795
Term of patent 14 years
U.S. Cl. D21—209

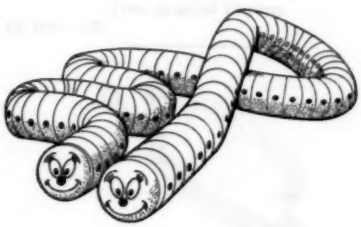


291,715
AIRFOIL FIN FOR SURFBOARDS
Denice C. Alpine, 7959 Woodlake, Canoga Park, Calif. 91304
Filed Oct. 29, 1985, Ser. No. 792,581
Term of patent 14 years
U.S. Cl. D21—236

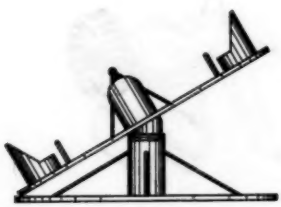


291,716
FLOAT
Henry S. Wolfe, 14480 62nd St. N., Clearwater, Fla. 33520
Filed Oct. 18, 1985, Ser. No. 789,156
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—237

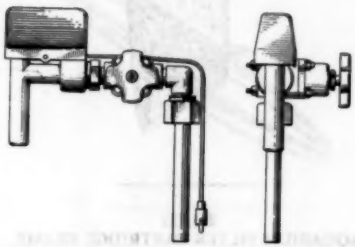
291,717
FAIRGROUND AMUSEMENT TUNNEL
Kevin C. Brooks, 500 Oxford Street, Bondi Junction N.S.W. 2022, Australia
Filed Feb. 27, 1985, Ser. No. 706,465
Term of patent 14 years
U.S. Cl. D21—242



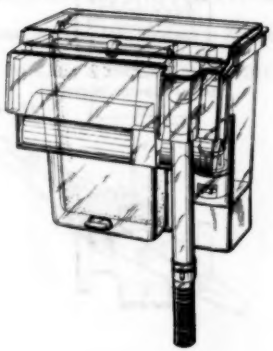
291,718
OCCUPANT PROPELLED AMUSEMENT DEVICE
Gerald A. Spencer, 1914 York, Independence, Mo. 64058
Filed Feb. 11, 1985, Ser. No. 700,668
Term of patent 14 years
U.S. Cl. D21—249



291,719
FAUCET FOR PROTECTING STERILE FLUID SYSTEMS
Narbik A. Karamian, Bethesda, Md., assignor to Raf-Tan Inc., Bethesda, Md.
Filed May 28, 1985, Ser. No. 737,879
Term of patent 14 years
U.S. Cl. D23—3



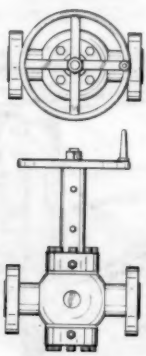
291,720
AQUARIUM FILTER PUMP
Allan H. Willinger, Englewood, N.J., and Monte Levin, New York, N.Y., assignors to Willinger Bros. Inc., Englewood, N.J.
Filed Mar. 11, 1985, Ser. No. 710,444
Term of patent 14 years
U.S. Cl. D23—4



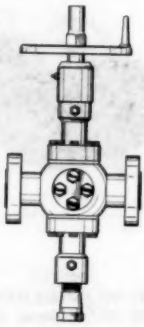
291,721
AQUARIUM FILTER CARTRIDGE
Allan H. Willinger, Englewood, N.J., assignor to Willinger Bros., Englewood, N.J.
Filed Dec. 16, 1985, Ser. No. 809,272
Term of patent 14 years
U.S. Cl. D23—4

291,722
AQUARIUM FILTER CARTRIDGE FRAME
Allan H. Willinger, Englewood, N.J., assignor to Willinger Bros., Inc., Englewood, N.J.
Filed Dec. 26, 1985, Ser. No. 813,531
Term of patent 14 years
U.S. Cl. D23—4

291,723
GATE VALVE
Willard E. Kemp, 14702 Broadgreen, Houston, Tex. 77079
Filed Jul. 5, 1983, Ser. No. 510,639
Term of patent 14 years
U.S. Cl. D23—19



291,724
GATE VALVE
Willard E. Kemp, 14702 Broadgreen, Houston, Tex. 77079
Filed Jul. 5, 1983, Ser. No. 510,655
Term of patent 14 years
U.S. Cl. D23—19



291,725
MULTIPLE PATTERN SPRAY NOZZLE
Claus O. Huckenbeck, Tehachapi, and Glenn S. White, Canoga Park, both of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Duarte, Calif.
Filed Nov. 27, 1984, Ser. No. 675,294
Term of patent 14 years
U.S. Cl. D23—35

291,726

GRID-LIKE GUARD FOR THE FRONT OF A PORTABLE HEATER

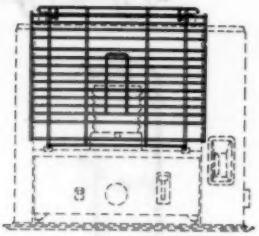
Nobuyuki Kojima; Youichi Sekigawa, and Makoto Kobiyama, all of Niigata, Japan, assignors to Toshiba Heating Appliances Co., Ltd., Niigata, Japan

Filed Mar. 7, 1984, Ser. No. 586,989

Claims priority, application Japan, Sep. 8, 1983, 58-38904; Sep. 8, 1983, 58-38905; Oct. 31, 1983, 58-169050[U]; Nov. 2, 1983, 58-170301[U]; Dec. 12, 1983, 58-53329; Dec. 12, 1983, 58-53330

Term of patent 14 years

U.S. Cl. D23—127



291,727

STOVE DOOR

John F. Desautels, Snohomish, Wash., assignor to Avalon Corporation International, Seattle, Wash.

Filed Aug. 5, 1985, Ser. No. 762,440

Term of patent 14 years

U.S. Cl. D23—128

291,728

SYRINGE CLIP

Garry Hoyt, Grapevine, Tex., assignor to Fisher Scientific Group Inc., San Diego, Calif.

Filed Mar. 6, 1985, Ser. No. 708,777

Term of patent 14 years

U.S. Cl. D24—27

291,729

SPINAL HOOK DISTRACTOR OR THE LIKE

Kevin M. Greig, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.

Filed May 8, 1985, Ser. No. 731,801

Term of patent 14 years

U.S. Cl. D24—27

291,730

REAGENT CONTAINER OR SIMILAR ARTICLE

Norman G. Kelln, and Thomas O. Tiffany, both of Spokane, Wash., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed Feb. 27, 1985, Ser. No. 706,071

Term of patent 14 years

U.S. Cl. D24—29

291,731

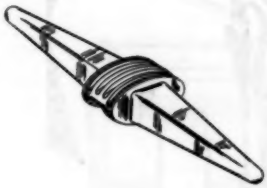
PROSTHETIC JOINT IMPLANT FOR A FINGER OR TOE OR THE LIKE

Jerry L. Aikins, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.

Filed May 8, 1985, Ser. No. 732,027

Term of patent 14 years

U.S. Cl. D24—33

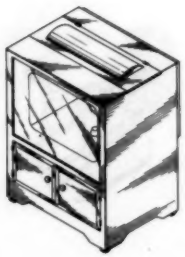


291,732
SURGICAL LAPAROTOMY PAD
Thomas Denny, East Brunswick, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.
Filed Dec. 19, 1983, Ser. No. 562,682
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—34

291,733
SURGICAL LAPAROTOMY PAD
Thomas Denny, East Brunswick, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.
Filed Dec. 19, 1983, Ser. No. 562,762
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—34

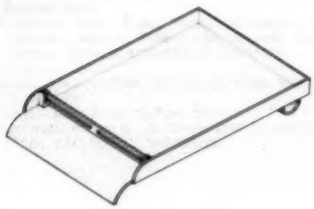
291,734
BODY MASSAGER
Desmond K. Shiu, Boston, Mass., assignor to Matrix International Industries, Inc, Boston, Mass.
Filed Feb. 27, 1985, Ser. No. 706,424
Term of patent 14 years
U.S. Cl. D24—36

291,735
AQUARIUM
Larry Billups, Lot 287, Air Base Mobile Home Park, Columbus, Miss. 39701
Filed Apr. 2, 1985, Ser. No. 719,137
Term of patent 14 years
U.S. Cl. D30—8

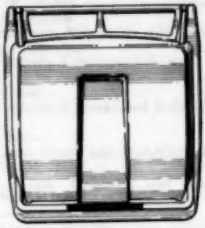


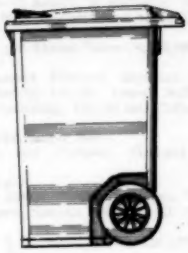
291,736
AQUARIUM AERATOR
Arno Richter, Osnabrück, Fed. Rep. of Germany, assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Sep. 25, 1984, Ser. No. 654,089
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 29 MR 727
Term of patent 14 years
U.S. Cl. D30—12

291,737
SINK DRAINBOARD
Walter C. McDaniel, Sr., Rte. 5, Box 92, Eufaula, Ala. 36027
Filed Sep. 26, 1985, Ser. No. 780,634
Term of patent 14 years
U.S. Cl. D32—56

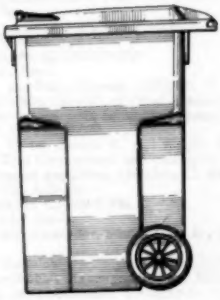


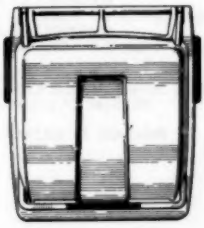
291,738
WASTE CONTAINER
Witold Orlowski, Helsingborg, Sweden, assignor to Perstorp AB, Perstorp, Sweden
Filed Mar. 26, 1985, Ser. No. 716,127
Claims priority, application Sweden, Sep. 27, 1984, 2583/84
Term of patent 14 years
U.S. Cl. D34—5





291,739
WASTE CONTAINER
Witold Orlowski, Helsingborg, Sweden, assignor to Perstorp AB, Perstorp, Sweden
Filed Mar. 26, 1985, Ser. No. 716,128
Claims priority, application Sweden, Sep. 27, 1984, 2584/84
Term of patent 14 years
U.S. Cl. D34—5





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TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Pipon, Yves; and Droulon, Georges, 4,690,458, Cl. 297-379.000.

Aarts, Mathias L. C., to Product Suppliers AG. Leakage detection with flexible bag. 4,689,987, Cl. 73-49.300.

Aasen, Steven M.; and Bryan, Thomas T., to Minnesota Mining and Manufacturing Company. Ethoxylated siloxane surfactants and hydrophilic silicones prepared therewith. 4,691,039, Cl. 556-446.000

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Carlsson, Gengt, 4,690,057, Cl. 102-266.000.

AB Tico: *See*—
Gustafsson, Paul, 4,690,290, Cl. 212-267.000.

Abdenour, Stephen F.; and Polatas, Stephen M., to B.F. Goodrich Company, The. Aircraft rotating wing seal. 4,690,352, Cl. 249-49.000.

Abe, Kazuharu: *See*—
Matsuda, Hitoshi; Okumura, Tsuguo; and Abe, Kazuharu, 4,690,792, Cl. 264-235.800.

Abed, Kamel Ben Y. Mechanical horse for children's play. 4,690,397, Cl. 272-53.200.

Acampora, Alfonse A., to RCA Corporation. Rate buffer control of difference signal decimation and interpolation for adaptive differential pulse code modulator. 4,691,233, Cl. 358-136.000.

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Rasmussen, Robert, 4,690,608, Cl. 414-529.000.

Acello, John J., to Eastman Kodak Company. Dropout compensator and luminance averager with "shared" delay. 4,691,249, Cl. 358-336.000.

ACF Industries, Incorporated: *See*—
Billingsley, Robert H.; and Jantzen, Steven L., 4,690,071, Cl. 105-404.000.

Adachi, Tsukasa: *See*—
Sakai, Yoshihiro; Ikeda, Ituso; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, 4,690,541, Cl. 355-4.000.

Adachi, Yoshitugu: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,690,788, Cl. 264-22.000.

Adams, Graham; and Jones, Martin A., to Dow Corning, Ltd. Foam control. 4,690,688, Cl. 44-76.000.

Adams Mfg.: *See*—
Adams, William E., 4,690,272, Cl. 206-45.280.

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Adkins, Ernest, to Klinger AG. Gaskets. 4,690,413, Cl. 277-199.000.

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Bayer, Izhak; and Adoram, Amnon, 4,690,132, Cl. 128-4.000.

Adrian, Willy; and Wente, Gerald, to Otis Elevator Company. Multifunction glassholder for escalator balustrade. 4,690,264, Cl. 198-335.000.

Advanced Control Engineering: *See*—
Swain, Danny C., 4,690,621, Cl. 417-313.000.

Advanced Micro Devices, Inc.: *See*—
Khu, Arthur H., 4,691,193, Cl. 340-347.0DD.
Schnizlein, Paul G.; and Tang, Wen-Tsung F., 4,691,122, Cl. 307-279.000.

Advanced Mineral Technologies, Inc.: *See*—
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,690,894, Cl. 435-244.000.

Advanced Polymer Systems, Inc.: *See*—
Won, Richard, 4,690,825, Cl. 424-501.000.

Aero-Metric General, Inc.: *See*—
Lange, Philip E., 4,691,143, Cl. 315-133.000.

Aeroquip Corporation: *See*—
Hughes, Brett A.; Gilbert, David L.; and Ellerbrock, Eugene A., 4,689,868, Cl. 29-523.000.

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Sato, Masaaki; Tanaka, Susumu; Kaeriyama, Kyoji; and Suda, Yoshio, 4,691,005, Cl. 528-380.000.

Ahrens, Allan F.; and Martinelli, Robert M., to Hughes Aircraft Company. Partial shunt switching limiter for a spacecraft solar-panel or like power-source array. 4,691,159, Cl. 323-222.000.

Aiba, Kazumi: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.

Aihara, Mitsuo: *See*—
Suzuki, Soichi; Aihara, Mitsuo; and Fujii, Mitsuo, 4,691,287, Cl. 364-490.000.

Air Products and Chemicals, Inc.: *See*—
Pinschmidt, Robert K., Jr.; Dixon, Dale D.; and Burgoyne, William F., Jr., 4,691,026, Cl. 548-531.000.

Roberts, George W.; Hansel, James G.; and Shahani, Goutam H., 4,690,215, Cl. 166-261.000.
Sircar, Shivaji; and Koch, William R., 4,690,696, Cl. 55-26.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Chiba, Yoshinori; Ishida, Keiichi; and Sugiura, Fumio, 4,690,456, Cl. 297-284.000.

Aisin-Warner Limited: *See*—
Sumiya, Koji; Watanabe, Kazuaki; and Kubo, Seitoku, 4,690,037, Cl. 92-130.00R.

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Inokuchi, Hiroo; Saito, Gunji; Seki, Kazuhiko; and Mori, Takehiko, 4,691,028, Cl. 549-36.000.
Tosa, Takafumi; Koga, Yoshihiro; and Matsuishi, Tsutomu, 4,691,054, Cl. 562-554.000.

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Akatsu, Tatsuo: *See*—
Takezawa, Yoshio; and Akatsu, Tatsuo, 4,690,969, Cl. 524-413.000.

Akiyama, Hiroi: *See*—
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Aktiengesellschaft Adolph Saurer: *See*—
Thalmann, Theo; and Oesterle, Gerhard, 4,690,176, Cl. 139-110.000.

Akutagawa, Susumu: *See*—
Yoshikawa, Sadao; Saburi, Masahiko; Ikariya, Takao; Ishii, Youichi; and Akutagawa, Susumu, 4,691,037, Cl. 556-18.000.

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van Os, Willem A. A. A., 4,690,136, Cl. 128-130.000.

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Ethington, Don; Riley, Ray J.; and Tock, Richard W., 4,690,743, Cl. 204-168.000.

Albanese, Thomas C. Apparatus for cutting out a face in a pumpkin. 4,689,885, Cl. 30-316.000.

Albean, David L., to RCA Corporation. Noise reduction circuit for television multi-channel sound. 4,691,234, Cl. 358-144.000.

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Diamond, Betty A., 4,690,905, Cl. 436-508.000.

Albert-Frankenthal AG: *See*—
Herb, Rudolf, 4,690,396, Cl. 271-311.000.

Alcon Laboratories, Inc.: *See*—
Falcetta, Joseph J.; and Park, Joonsup, 4,690,993, Cl. 526-242.000.

Aldrich, Roger B.; and White, Gary R., to Chief Automotive Systems, Inc. Measuring device for use with automotive frame straightening equipment. 4,689,888, Cl. 33-288.000.

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Umiker, Hans, 4,690,751, Cl. 209-3.300.

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Dobbs, Robert J.; and Alexander, Shuford M., Jr., 4,690,693, Cl. 51-307.000.

Alig, Franz; Bocker, Heinrich; Neulinger, Franz; and Schummer, Helmut, to Metallgesellschaft Aktiengesellschaft. Method of automatically controlling an electrostatic precipitator. 4,690,694, Cl. 55-4.000.

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Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,765, Cl. 210-654.000.
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Allara, David L.; and Nuzzo, Ralph G., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Modification of the properties of metals. 4,690,715, Cl. 148-6.15R.

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Anderson, Hugh B., 4,690,801, Cl. 422-68.000.

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Struger, Odo J., 4,691,296, Cl. 364-900.000.

Allen, Keith: *See*—
Keetley, Reginald G.; and Allen, Keith, 4,690,614, Cl. 416-43.000.

Allen, Steven P.: *See*—
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Allers, Tyark; and Blasczyk, Gotthardt, to Krupp Polysius AG. Methods and apparatus for two-stage crushing. 4,690,335, Cl. 241-24.000.

Allied Colloids Limited: *See*—
Flesher, Peter; Clarke, John; and Marshall, David, 4,690,971, Cl. 524-555.000.

Allied Corporation: *See*—
Hale, Charles S.; Matzkin-Bridger, Andrew; and Morse, Ronald W., 4,690,487, Cl. 350-96.210.
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Plaot, Michael, 4,690,485, Cl. 350-6.500.
Snow, Wayne R.; Isliker, Gaston R.; and Johnson, Colin A., deceased, 4,690,480, Cl. 439-364.000.

Alltech Associates, Inc.: *See*—
Anderson, James M., Jr., 4,690,437, Cl. 285-356.000.

Alon, Gad, to Chattanooga Corporation. Neuromuscular stimulating apparatus. 4,690,146, Cl. 128-422.000.

Alos AG: *See*—
Wydler, Peter, 4,691,112, Cl. 250-570.000.

Alps Electric Co., Ltd.: *See*—
Kamijyo, Yoshimi, 4,690,813, Cl. 423-606.000.
Oba, Hiroki; Aoki, Seiichi; Niinuma, Akira; and Sato, Seiichiro, 4,690,484, Cl. 439-736.000.
Watanabe, Masamichi; and Watanabe, Yasushi, 4,691,188, Cl. 338-307.000.

Altenschoepfer, Theodor: *See*—
Jeschke, Peter; Altenschoepfer, Theodor; Jacobs, Jochen; and Schumann, Klaus, 4,690,770, Cl. 252-99.000.

Ambrosiani, Vincent F.: *See*—
Lassiter, B. Dean; and Ambrosiani, Vincent F., 4,690,847, Cl. 428-71.000.

Amemiya, Kouji: *See*—
Naito, Takanobu; Yokoyama, Masaaki; Sasaki, Kazuya; Yamamoto, Makoto; and Amemiya, Kouji, 4,691,014, Cl. 540-227.000.

American Mediscan, Inc.: *See*—
Juncosa, Robert D., 4,690,152, Cl. 128-734.000.

American Science and Engineering, Inc.: *See*—
Burstein, Paul; Krieger, Allen; Annis, Martin; and Chase, Richard C., 4,691,332, Cl. 378-7.000.

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Han, Doyoung; and Renaud, Merle A., 4,689,967, Cl. 62-201.000.
Hart, James E., 4,690,463, Cl. 303-37.000.

American Telephone and Telegraph Company: *See*—
Luryi, Sergey, 4,691,215, Cl. 357-22.000.
Vanacore, Vincent D., 4,691,346, Cl. 379-198.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Allara, David L.; and Nuzzo, Ralph G., 4,690,715, Cl. 148-6.15R.
Bayruns, Robert J.; and Weston, Harry T., 4,691,331, Cl. 377-47.000.
Becke, Hans W.; and Smith, Robert K., 4,691,220, Cl. 357-39.000.
Luther, Lars C.; and Singh Rana, Virendra V., 4,690,726, Cl. 156-624.000.
Stanley, Keith R.; and Winchell, David F., 4,691,347, Cl. 379-203.000.

American Telephone & Telegraph Company, AT&T Information Systems Inc.: *See*—
Khanna, Satya P., 4,691,363, Cl. 381-205.000.

American Telephone and Telegraph Company, AT&T Technologies, Inc.: *See*—
Cartwright, John S., 4,689,866, Cl. 29-426.600.

Ammann, David: *See*—
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Amoco Corporation: *See*—
Domeier, Linda A.; and Gardner, Hugh C., 4,691,025, Cl. 548-521.000.
Taggart, Davis L.; and Heffern, Edward W., 4,690,217, Cl. 166-274.000.

AMP Incorporated: *See*—
Croman, Stanley W. T.; Jordan, Janet M.; and Paukovits, Edward J., Jr., 4,690,266, Cl. 198-388.000.
Hamsher, Wilbur A., Jr.; and Long, William B., 4,690,647, Cl. 439-92.000.
Hollyday, Robert D.; and Yeager, Patrick F., 4,690,479, Cl. 439-97.000.
Smith, Mark L.; and Wagner, Richard M., 4,690,747, Cl. 204-206.000.

Amundson, Anthony P.: *See*—
Bergins, Lewis A.; Amundson, Anthony P.; and Falk, Jerry, 4,691,314, Cl. 370-94.000.

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Gob, Werner; and Anders, Peter, 4,690,103, Cl. 123-41.120.

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Killop, James T.; and Holbrook, Gerald W., 4,689,980, Cl. 72-88.000.

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Anderson, James M., Jr., to Alltech Associates, Inc. Low pressure fitting. 4,690,437, Cl. 285-356.000.

Ando, Hiromi; Endo, Mitsuhiro; and Ono, Yukou, to Tokico Ltd. Pneumatic booster. 4,690,034, Cl. 91-369.00A.

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Ando, Yujiro: *See*—
Inaba, Yutaka; and Ando, Yujiro, 4,691,213, Cl. 346-159.000.

Andrade, Juan; Prescher, Gunter; and Kohler, Klaus, to Degussa Aktiengesellschaft. Process for the production of 4-chloro-butanals. 4,691,062, Cl. 568-495.000.

Andreas, David W.: *See*—
Watkins, James D.; and Andreas, David W., 4,691,374, Cl. 383-104.000.

Andreas Stihl: *See*—
Kottke, Joachim; and Zerrer, Gerhard, 4,690,252, Cl. 188-69.000.

Andrew, Sydney P.; Doy, Ralph J.; and Limbach, Antony P. J., to Imperial Chemical Industries plc. Steam reforming hydrocarbons. 4,690,690, Cl. 48-214.00A.

Anelva Corporation: *See*—
Ino, Yoichi, 4,691,160, Cl. 324-71.300.

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Anilionis, Algis: *See*—
Palmer, John L.; and Anilionis, Algis, 4,691,009, Cl. 530-350.000.

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Burstein, Paul; Krieger, Allen; Annis, Martin; and Chase, Richard C., 4,691,332, Cl. 378-7.000.

Antonio, Joseph M.: *See*—
Armer, Leon N., Jr.; Antonio, Joseph M.; Roth, Craig A.; and VerWeire, James R., 4,690,061, Cl. 102-401.000.

Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivatives of tetrahydrobenzothiazole and herbicidal compositions containing the same as an active ingredient. 4,690,704, Cl. 71-90.000.

Aoki, Kozo: *See*—
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Aoki, Seiichi: *See*—
Oba, Hiroki; Aoki, Seiichi; Niinuma, Akira; and Sato, Seiichiro, 4,690,484, Cl. 439-736.000.

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Appelgren, Curt H.; and Ivarsson, Nemo. Process for coating solid particles. 4,690,834, Cl. 427-189.000.

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Applied Retrieval Technology, Inc.: *See*—
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Brown, Richard W.; and Ardolf, Duane R., 4,691,344, Cl. 379-106.000.

Arabori, Hideo: *See*—
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Arens, Georges; and Philippe, Staron, to Societe Nationale Elf Aquitaine (Production). Method for the processing of recordings of signals resulting from a seismic exploration of a medium. 4,691,306, Cl. 367-40.000.

ARES, Inc.: *See*—
Stoner, Eugene M., 4,690,032, Cl. 89-43.010.

Arikawa, Yoshijiro: *See*—
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, 4,691,053, Cl. 562-531.000.

Arimoto, Shunji: *See*—
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Arino, Masao; and Kobayashi, Michio, to Jidosha Kiki Co., Ltd. Brake booster. 4,689,958, Cl. 60-547.100.

Armer, Leon N., Jr.; Antonio, Joseph M.; Roth, Craig A.; and Ver-Weire, James R. Land mine for use in a simulated war game. 4,690,061, Cl. 102-401.000.

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Arthur, Frank H., to Envopak Group Limited. Security seal with rupturable wall. 4,690,444, Cl. 292-324.000.

Arthur, James C.; and Baldwin, Freddie A., to Arvin Industries, Inc. Tuned exhaust manifold. 4,689,952, Cl. 60-313.000.

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Arvin Industries, Inc.: *See*—
Arthur, James C.; and Baldwin, Freddie A., 4,689,952, Cl. 60-313.000.

Asahi Glass Company Ltd.: *See*—
Okada, Takeshi; Hashimoto, Haruto; and Uemura, Michihiko, 4,691,178, Cl. 333-143.000.

Asahi Gomu Kako Kabushiki Kaisha: *See*—
Hayashi, Sadao, 4,690,399, Cl. 272-122.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Masuda, Yoshinori; Saito, Hiroshi; and Kobayashi, Hiroshi, 4,690,994, Cl. 526-254.000.

Asai, Masaki, to Meitoh Denki Kohji Kabushiki Kaisha. Pulley block assembly for aerial line. 4,690,381, Cl. 254-394.000.

Asakura, Masahiko: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Shiina, Takanori; Matsumoto, Yukihiro; and Muroya, Minoru, 4,690,121, Cl. 123-589.000.

Asami, Ken; Onuma, Toshio; Ohashi, Kaoru; and Buma, Shuuichi, to Toyota Jidosha Kabushiki Kaisha. Rear suspension controller. 4,690,429, Cl. 280-707.000.

Asanuma, Nobuyoshi: *See*—
Kubo, Kanji; Asanuma, Nobuyoshi; Saito, Kazuo; and Yamamoto, Yasuhiko, 4,690,426, Cl. 280-690.000.

Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, to Hoffmann-La Roche Inc. Derivatives of 10,11-dihydro-5H-dibenzo[a,d]cycloheptene-5-ethanol. 4,691,040, Cl. 558-44.000.

ASEA Aktiebolag: *See*—
Dahlquist, Håkan; and Kaufmann, Herbert, 4,690,012, Cl. 74-479.000.

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Hashimoto, Takafumi; Kamanaka, Yoshihide; and Ashikaga, Tadashi, 4,691,158, Cl. 320-14.000.

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Shirahata, Kunikatsu; Kono, Motoenichi; Saito, Yutaka; Kasai, Masaji; Morimoto, Makoto; and Ashizawa, Tadashi, 4,691,024, Cl. 548-422.000.

Aslesen, Kerby S.; Bocek, John R.; Canfield, Dennis R.; and Liu, Ke-Tien, to Chevron Research Company. Method and apparatus for testing the outflow from hydrocarbon wells on site. 4,689,989, Cl. 73-61.10R.

AT&T Bell Laboratories: *See*—
Luryi, Sergey, 4,691,215, Cl. 357-22.000.
Lyons, Alan M.; Mendenhall, Frederick T., Jr.; Robbins, Murray; Quick, Nathaniel R.; and Wilkins, Cletus W., Jr., 4,691,091, Cl. 219-121.0LM.

AT&T Information System Inc.: *See*—
Vanacore, Vincent D., 4,691,346, Cl. 379-198.000.

AT&T Technologies: *See*—
Lyons, Alan M.; Mendenhall, Frederick T., Jr.; Robbins, Murray; Quick, Nathaniel R.; and Wilkins, Cletus W., Jr., 4,691,091, Cl. 219-121.0LM.

ATOMIKA Technische Physik GmbH: *See*—
Mertens, Horst M.; and Bogl, Leonhard, 4,690,098, Cl. 118-727.000.

Aucagne, Jean: *See*—
Auduc, Herve ; and Aucagne, Jean, 4,690,851, Cl. 428-116.000.

Audio-Technica U.S., Inc.: *See*—
Reichel, Kenneth R.; and Hebrock, Steve, 4,691,349, Cl. 379-391.000.

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Ausnit, Steven, to Minigrip, Incorporated. Zipper closure with unitary adhesive cover sheet. 4,691,373, Cl. 383-63.000.

Austin, Franklin D.: *See*—
Hardey, Donald H.; and Austin, Franklin D., 4,690,198, Cl. 164-316.000.

Automated Machinery Systems: *See*—
Off, Joseph W. A.; and Ferguson, Vivian, 4,690,078, Cl. 112-121.120.

Automotive Collision Tools, Inc.: *See*—
Jarman, Davis R.; and Hinson, Virgil H., 4,690,378, Cl. 254-8.00B.

Avantek, Inc.: *See*—
Westgate, Wayne F., 4,691,380, Cl. 455-328.000.

Aviv, Gershon: *See*—
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,765, Cl. 210-654.000.
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,766, Cl. 210-654.000.

Avon Industrial Polymers Limited: *See*—
West, John P., 4,690,389, Cl. 267-140.100.

Awaji, Toshio: *See*—
Suzuki, Akimitsu; Awaji, Toshio; and Igari, Kozaburo, 4,690,257, Cl. 192-3.310.

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Castagna, Wolfgang; Krankenhagen, Jochen; Ortwein, Heinz; and Weertz, Klaus, 4,690,081, Cl. 112-276.000.

Azukizawa, Teruo: *See*—
Morishita, Mimpei; and Azukizawa, Teruo, 4,690,066, Cl. 104-282.000.

B.F. Goodrich Company, The: *See*—
Abdenour, Stephen F.; and Polatas, Stephen M., 4,690,352, Cl. 249-49.000.

B & W Loudspeakers Limited: *See*—
Dickie, Laurence G., 4,690,244, Cl. 181-146.000.

Babbitt, Richard W.: *See*—
Stern, Richard A.; and Babbitt, Richard W., 4,691,208, Cl. 343-785.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, 4,691,053, Cl. 562-531.000.

Babcock & Wilcox Company, The: *See*—
Glass, Samuel W., III, 4,689,985, Cl. 73-1.00R.
Sterling, Edward L., Jr.; and Thompson, William L., 4,691,328, Cl. 375-36.000.

Babka, Josef: *See*—
Kolinsky, Miloslav; Jisova, Vaclava; and Babka, Josef, 4,690,989, Cl. 526-88.000.

Badger, Robert J. T. Utility game bag system. 4,690,045, Cl. 99-485.000.

Bahov, Dinko A.; and Bahov, Hristo A., to NPK "Textilno Maschinostroene" . Vortex air nozzle for yarn spinning from staple fibers. 4,689,948, Cl. 57-328.000.

Bahov, Hristo A.: *See*—
Bahov, Dinko A.; and Bahov, Hristo A., 4,689,948, Cl. 57-328.000.

Bailey, Randal N.; and Crews, Purvis J. Infant seat for automobiles. 4,690,455, Cl. 297-238.000.

Bailey, Samuel G. Talking marionette with theatre. 4,690,655, Cl. 446-84.000.

Baker, Alan J. Method and apparatus for measuring angular displacement. 4,691,192, Cl. 340-347.00P.

Baker, Harold R.; Thrower, Eugene S.; and Simpson, David C., to Clorox Company, The. Hard surface cleaning composition. 4,690,779, Cl. 252-546.000.

Bakr, Mamdouh M.; and Maloney, Bobby J., to Delta Wood Products, Inc. Sewing machine cabinet and lift. 4,690,466, Cl. 312-29.000.

Balcke-Durr Aktiengesellschaft: *See*—
Trage, Burkhard; and Leitz, Richard, 4,690,207, Cl. 165-113.000.

Baldwin, Freddie A.: *See*—
Arthur, James C.; and Baldwin, Freddie A., 4,689,952, Cl. 60-313.000.

Baldwin, John J.: *See*—
Huff, Joel R.; Vacca, Joseph P.; and Baldwin, John J., 4,690,928, Cl. 514-285.000.

Balleys, Francois, to Charmilles Technologies S.A. Travelling wire EDM apparatus with monitoring of the number of electrical discharges occurring in a sector of the active portion of the electrode wire. 4,691,089, Cl. 219-69.00W.

Balzano, Savino, to Metallurgiche Balzano S.p.A. Tool for peeling and coring pineapples and the like. 4,690,047, Cl. 99-542.000.

Banas, Conrad M.; and Doyle, Brian M., to United Technologies Corporation. Twin spot laser welding. 4,691,093, Cl. 219-121.0LC.

Bandel, Rudolf: *See*—
Schroder, Joachim; Bozung, Hanns-Gunter; Bandel, Rudolf; and Mendle, Hans, 4,689,960, Cl. 60-607.000.

Banker, Henry: *See*—
Conlogue, James H.; and Banker, Henry, 4,690,115, Cl. 123-366.000.

Banks, Henry J.; and Wiseman, John R., to Commonwealth Scientific and Industrial Research Organization. Prevention, arresting and removal of accumulation of moisture in bunker storages. 4,690,041, Cl. 98-57.000.

Bantle, Manfred; and Lechner, Reinhard, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Central locking arrangement. 4,690,462, Cl. 301-9.0CN.

Bar-Nefy, Simcha; and Tiomkin, Michael, to Israel Aircraft Industries Ltd. Mine field clearing apparatus. 4,690,030, Cl. 89-1.130.

Barber, Michael T. Adjustable rubber band. 4,689,858, Cl. 24-17.00B.

Barch, Herbert W.: *See*—
Smoot, Michael A.; Barch, Herbert W.; and Das, Balbhadra, 4,690,760, Cl. 210-321.500.

Barnabe, Nancy P.: *See*—
Hou, Ching-Tsang; and Barnabe, Nancy P., 4,690,891, Cl. 435-42.000.

Barnett, Timothy J., to Elixir Industries. Snap-in screen frame and mounting for same. 4,690,040, Cl. 98-2.140.

Barowski, Karlheinz; and Berghammer, Conrad, to Braun Aktiengesellschaft. Hair roller heating device with thermomagnetic roller temperature control. 4,691,095, Cl. 219-222.000.

Barrow, William A.: *See*—
King, Christopher N.; Dolinar, Brian J.; Barrow, William A.; Flegal, Robert T.; Gulick, Paul E.; and Blacken, Laurin G., 4,691,144, Cl. 315-169.300.

Barrus, Donald M.: *See*—
Matouk, Anthony F.; Hoffman, David C.; and Barrus, Donald M., 4,691,274, Cl. 363-141.000.

Barry, Robert F.: *See*—
Sabol, George P.; and Barry, Robert F., 4,690,716, Cl. 148-11.50F.

Bartl, Herbert: *See*—
Starzewski, Karl-Heinz A. O.; Witte, Josef; and Bartl, Herbert, 4,691,036, Cl. 556-16.000.

Bartmann, Klaus: *See*—
Schnizler, Albrecht; Schulz, Manfred; and Bartmann, Klaus, 4,690,226, Cl. 173-128.000.

Bartok, Stephen: *See*—
Morrison, Donald L.; and Bartok, Stephen, 4,690,193, Cl. 160-133.000.

Barton, Richard O.; Bergin, Michael T.; and Miller, John M., to Grumman Aerospace Corporation. Hole centration gage. 4,690,563, Cl. 356-375.000.

Barton, Richard O.: *See*—
Miller, John; Barton, Richard O.; and Schaefer, Oscar H., 4,690,365, Cl. 248-650.000.

BASF Aktiengesellschaft: *See*—
Fischer, Adolf, deceased, 4,690,706, Cl. 71-91.000.
Ruechardt, Christoph; Jaehme, Joachim; and Salz, Ulrich, 4,691,020, Cl. 546-341.000.
Schick, Hans; Kolk, Erich; Fauth, Karl-Heinz; and Mohr, Heinrich, 4,691,072, Cl. 585-525.000.

BASF Corporation: *See*—
Ramlow, Gerhard G.; Heyman, Duane A.; and Grace, Oscar M., 4,690,956, Cl. 521-137.000.

BASF Farben & Fasern AG: *See*—
Hegemann, Gunther; and Miedeck, Karin, 4,691,002, Cl. 528-289.000.

Bassi, Dario; and Palau, Joseph, to Etablissements Staubli Verdol. Mobile hook for the shed forming device of a weaving loom. 4,690,178, Cl. 139-455.000.

Basting, Jack A. Tensile exercise device. 4,690,402, Cl. 272-137.000.

Batcheller, Roy W., to Craneveyor Corp. Panel rail system. 4,690,383, Cl. 256-24.000.

Bateman, Andrew: *See*—
McGeehan, Joseph P.; and Bateman, Andrew, 4,691,375, Cl. 455-71.000.

Bates, Carl H., to Stemcor Corporation. Silicon nitride/silicon carbide composition and articles thereof. 4,690,790, Cl. 264-63.000.

Baum, Robert A. Electrode assembly especially adapted to utilizing a magnetic field for measuring electric conductivity of treated non-polar liquids. 4,691,169, Cl. 324-448.000.

Baumgartner, Kenneth A.; and Pickering, William, to Caterpillar Industrial Inc. Apparatus and method for protecting a motor control circuit. 4,691,149, Cl. 318-331.000.

Bausch & Lomb Incorporated: *See*—
Clark, James A.; and Emmel, Henry J., 4,690,519, Cl. 350-515.000.
Ogunbiyi, Lai; and Smith, Francis X., 4,690,773, Cl. 252-174.120.
Shawcross, Alfred L.; Stevens, Donn E.; and Jones, Robert E., 4,690,520, Cl. 350-517.000.

Baxter Travenol Laboratories, Inc.: *See*—
Leonard, Ronald J.; and Johnson, Kenneth M., 4,690,758, Cl. 210-247.000.

Bayer Aktiengesellschaft: *See*—
Starzewski, Karl-Heinz A. O.; Witte, Josef; and Bartl, Herbert, 4,691,036, Cl. 556-16.000.
Wahle, Bernd; Freitag, Dieter; Uerdingen, Walter; Heine, Heinrich; and Blazejak, Manfred, 4,690,998, Cl. 528-96.000.

Bayer, Izhak; and Adoram, Amnon. Endoscope particularly useful as an anoscope. 4,690,132, Cl. 128-4.000.

Bayruns, Robert J.; and Weston, Harry T., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Self-correcting frequency dividers. 4,691,331, Cl. 377-47.000.

BBC Brown, Boveri & Company, Limited: *See*—
Hirth, Michael, 4,690,803, Cl. 422-186.180.

BCD Dryers, Inc.: *See*—
Behrens, Rudolph, 4,689,893, Cl. 34-23.000.

Beard, Robert W., to Oximetrix, Inc. Optical coupling. 4,690,492, Cl. 350-96.200.

Beauregard, William W.; and Fessenden, Peter J., to Springfield Wire, Inc. PTC heater and method of manufacture. 4,689,878, Cl. 29-611.000.

Beaver, Richard N.; Morris, Gregory J.; Pimlott, John R.; and Dang, Hiep D., to Dow Chemical Company, The. Plastic electrochemical cell terminal unit. 4,690,748, Cl. 204-279.000.

Beccaris, Carlo: *See*—
Marchisio, Aldo; and Beccaris, Carlo, 4,690,659, Cl. 464-68.000.

Becke, Hans W.; and Smith, Robert K., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Radial high voltage bidirectional switch structure with concavo-concave shaped semiconductor regions. 4,691,220, Cl. 357-39.000.

Becker-Ross, Helmut: *See*—
Florek, Stefan; Becker-Ross, Helmut; Dobschal, Hans-Jurgen; and Mohr, Joachim, 4,690,559, Cl. 356-328.000.

Beckerleg, Richard A.; Fernald, Mark R.; LaTorre, Richard R.; and Grosso, Vincent A., to Raytheon Company. Infrared seeker. 4,690,351, Cl. 244-3.160.

Beckley, Keith A.; Jacob, Neil R.; and Trussler, Geoffrey A., to Smiths Industries Public Limited Company. Fluid-gauging probes and their manufacture. 4,689,991, Cl. 73-304.00C.

Beckman Industrial Corporation: *See*—
Dzula, Gregory, 4,691,168, Cl. 324-439.000.

Beckman Instruments, Inc.: *See*—
Leytes, Lev J.; and Penhasi, Harry A., 4,690,165, Cl. 137-112.000.

Becton, Dickinson and Company: *See*—
Losada, Robert J.; and Conway, Hugh T., 4,690,153, Cl. 128-763.000.

Bezcham Group p.L.c.: *See*—
Harris, Patrick C.; and Wilcox, John A., 4,691,029, Cl. 549-79.000.

Beele, Gunther, to Kloeckner-Humboldt-Deutz AG. Method for storing and maintaining the temperature of molten metal. 4,690,385, Cl. 266-44.000.

Beever, William H.: *See*—
Johnson, Timothy W.; Beever, William H.; O'Connor, James E.; and Blackwell, Jennings P., 4,690,972, Cl. 524-609.000.

Behme, Werner; and Berleth, Manfred, to Cambridge Instruments GmbH. Microtome feed-motor control. 4,691,151, Cl. 318-571.000.

Behrens, Rudolf A.; and Seltzer, Raymond, to Ciba-Geigy Corporation. Hydroxylamines derived from hindered amines. 4,691,015, Cl. 544-198.000.

Behrens, Rudolph, to BCD Dryers, Inc. Apparatus and method for drying elongated webs. 4,689,893, Cl. 34-23.000.

Bein, Jeffrey D., to Westinghouse Electric Corp. Nuclear steam generator wrapper barrel/tube support plate connection assembly and radial tuning method for assembling same. 4,690,206, Cl. 165-81.000.

Beitinger, Eberhard: *See*—
Nussbaumer, Manfred; Glaser, Eberhard; and Beitinger, Eberhard, 4,690,590, Cl. 405-267.000.

Belanger, Inc.: *See*—
Belanger, James A.; Wentworth, Robert; and Lapham, James M., 4,690,065, Cl. 104-172.300.

Belanger, James A.; Wentworth, Robert; and Lapham, James M., to Belanger, Inc. Automobile conveyor. 4,690,065, Cl. 104-172.300.

Beleov, Marin H.: *See*—
Garlanov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.

Belka, Heinrich, to ESGE-Marby GmbH & Co. KG. Vibration-resistant, self-centering accessory attachment for a cycle. 4,690,420, Cl. 280-289.00A.

Bell, David A.: *See*—
Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; Holloway, Thomas C.; and Bell, David A., 4,690,730, Cl. 156-643.000.

Bell, Larry. Sea rescue kit for deployment from a helicopter. 4,690,650, Cl. 441-40.000.

Beller, Frank W., to Belson Manufacturing Co., Inc. Mesquite burning outdoor cooking device. 4,690,125, Cl. 126-25.00A.

Belson Manufacturing Co., Inc.: *See*—
Beller, Frank W., 4,690,125, Cl. 126-25.00A.

Bender, Richard H.: *See*—
Kuzyk, Roman; Bender, Richard H.; and Edwards, Lew, 4,690,546, Cl. 355-69.000.

Bennett, William S., to Singer Company, The. High performance multi-processor system. 4,691,280, Cl. 364-200.000.

Benson, Walter L. Cast resin light-emitting display device. 4,691,268, Cl. 362-223.000.

Bentonspritz Nascgubeb GmbH Co.: *See*—
Roehl, Franz, 4,690,328, Cl. 239-227.000.

Beppu, Teruhiko; Iwamoto, Yasushi; and Yoshida, Minoru, to Beppu, Teruhiko. Use of trichostatin compounds for treating tumor cells. 4,690,918, Cl. 514-23.000.

Berg, Lloyd; and Yeh, An-I. Separation of n-amyl acetate from n-amyl alcohol by extractive distillation. 4,690,734, Cl. 203-56.000.

Berger, Lawrence E., to C-Lock Retention Systems, Inc. Seawall. 4,690,588, Cl. 405-262.000.

Berghammer, Conrad: *See*—
Barowski, Karlheinz; and Berghammer, Conrad, 4,691,095, Cl. 219-222.000.

Bergin, Michael T.: *See*—
Barton, Richard O.; Bergin, Michael T.; and Miller, John M., 4,690,563, Cl. 356-375.000.

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Behme, Werner; and Berleth, Manfred, 4,691,151, Cl. 318-571.000.

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Bertelsen, Matthew H.; and Klapperich, Gary, to Bertelsen, Matthew H. Computer environment filter apparatus having wing with internal baffles. 4,690,042, Cl. 98-115.100.
Berthet, Maurice, to Compagnie Gervais Danone. Assembly for storing, transporting and distributing objects of the bottle, flask or similar types and process for manufacturing same. 4,690,281, Cl. 206-597.000.
Bertin, Jean: *See*—
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, 4,690,931, Cl. 514-317.000.
Bertolasi, Robert B.: *See*—
Harvey, Dennis N.; and Bertolasi, Robert B., 4,690,001, Cl. 73-800.000.
Berton, Andrew S., to Incomm Direct Pty. Ltd. Word forming tile game. 4,690,410, Cl. 273-299.000.
Bertram, Leo; and Schemmann, Hugo, to U.S. Philips Corporation. Synchronous motor with two-pole permanent-magnet soft-magnetic-core rotor. 4,691,132, Cl. 310-156.000.
Betts, David R.; and Edmonds, Michael G., to Kentinental Engineering Limited. Foldable trolley. 4,690,417, Cl. 280-42.000.
Beyer, Karl, to LN Industries SA. Elastic hinge for eyeglasses. 4,689,851, Cl. 16-228.000.
Beyer, Rudolf: *See*—
Klie, Jurgen; and Beyer, Rudolf, 4,690,038, Cl. 92-181.00R.
Bhatia, Kishan; and Garcia, John G., Jr., to NL Industries, Inc. Process for removal of mercaptans from gas streams. 4,690,805, Cl. 423-224.000.
Bianchetti, Alberto: *See*—
Nisato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, 4,691,019, Cl. 546-330.000.
Bianchi, Giuseppe: *See*—
Occhini, Elio; and Bianchi, Giuseppe, 4,690,497, Cl. 350-96.230.
Bianchi, John E. Universal clip. 4,690,315, Cl. 224-252.000.
BICC Public Limited Company: *See*—
Horne, David; and Parker, Laurence, 4,690,286, Cl. 211-41.000.
Taylor, John E.; and Keene, Ian W., 4,690,499, Cl. 350-96.230.
Biehler, Klaus: *See*—
Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, 4,691,110, Cl. 250-458.100.
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Weber, Robert; Bieselt, Roland; Forner, Siegfried; and Mechtold, Helmut, 4,689,863, Cl. 29-33.00T.
Billet, Rene , to Valeo. Transmission system, in particular for automobile vehicles, hydraulic coupling unit comprising same, movement take-up device adapted for use in same, and method of manufacturing said movement take-up device. 4,689,954, Cl. 60-338.000.
Billingsley, Robert H.; and Jantzen, Steven L., to ACF Industries, Incorporated. Truss end structure for stub sill hopper cars. 4,690,071, Cl. 105-404.000.
Binks Manufacturing Company: *See*—
Cavanaugh, James E.; Erwin, Larry; and Hetherington, Robert D., 4,690,308, Cl. 222-156.000.
BIP Chemicals, Ltd.: *See*—
Taylor, David, 4,691,001, Cl. 528-256.000.
Birkmeyer, William J.: *See*—
Singer, Debra L.; Birkmeyer, William J.; Dowbenko, Rostyslaw; and Kania, Charles M., 4,690,980, Cl. 525-286.000.
Biro, Alexander J., to Winchester Industries, Inc. Thermally insulated window sash construction for a casement window. 4,689,933, Cl. 52-656.000.
Biron, David G.: *See*—
Edwards, Brian E.; and Biron, David G., 4,690,551, Cl. 356-5.000.
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Lattion, Andre; Bischofberger, Jurg; Salvik, Walter; Stapfer, Jakob; and Schreiber, Manfred, 4,689,945, Cl. 57-263.000.
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Zimmerman, John M.; Noren, Gerry K.; and Bishop, Timothy E., 4,690,501, Cl. 350-96.290.
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Black, Charles E., III: *See*—
Habecker, John W.; and Black, Charles E., III, 4,691,086, Cl. 200-159.00R.
Black & Decker Inc.: *See*—
Chaconas, Peter C., 4,690,024, Cl. 83-852.000.
Blacken, Laurin G.: *See*—
King, Christopher N.; Dolinar, Brian J.; Barrow, William A.; Flegal, Robert T.; Gulick, Paul E.; and Blacken, Laurin G., 4,691,144, Cl. 315-169.300.
Blackwell, Jennings P.: *See*—
Johnson, Timothy W.; Beever, William H.; O'Connor, James E.; and Blackwell, Jennings P., 4,690,972, Cl. 524-609.000.
Blaha, William E., to Ideal Industries, Inc. Screw-on wire connector. 4,691,079, Cl. 174-87.000.
Blanc GmbH & Company: *See*—
Muck, Manfred; Blanc, Walter; and Muller, Hans-Albert, 4,689,840, Cl. 4-629.000.
Blanc, Walter: *See*—
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Blaszyk, Gotthardt: *See*—
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Blass, Judd; and Keren, Hanan, to Elscint Ltd. Dual frequency surface probes. 4,691,163, Cl. 324-318.000.
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Wahle, Bernd; Freitag, Dieter; Uerdingen, Walter; Heine, Heinrich; and Blazejak, Manfred, 4,690,998, Cl. 528-96.000.
Bleeke, William F.: *See*—
Loubier, Robert J.; and Bleeke, William F., 4,691,185, Cl. 338-32.00H.
Bleth, Joel J.; and Tormaschy, Williard R. Fluid inductor and metering device and method of use. 4,690,179, Cl. 141-1.000.
Bloomfield, John W., III. Voice simulator. 4,691,360, Cl. 381-70.000.
Bloomquist, Ted C., to IMED Corporation. Dual mode I.V. infusion device with distal sensor. 4,690,673, Cl. 604-67.000.
Blouin, Joseph D.: *See*—
Manning, Thomas J.; Ritzert, Jack L.; Blouin, Joseph D.; and Mowinski, Josephine A., 4,690,435, Cl. 285-256.000.
Bluff Welding Inc.: *See*—
Sherrod, Danny, 4,689,846, Cl. 14-71.300.
Blum, Stephen C.; and Deriso, John, to Motorola, Inc. Filled resonant cavity filtering apparatus. 4,691,179, Cl. 333-202.000.
Board of Regents, The University of Texas System: *See*—
Cantrell, C. D.; and Peterson, G. L., 4,690,742, Cl. 204-157.200.
Bobkov, Jury G.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.
Boc Group, Inc., The: *See*—
Lofredo, Antony, 4,689,962, Cl. 62-54.000.
Bocek, John R.: *See*—
Aslesen, Kerby S.; Bocek, John R.; Canfield, Dennis R.; and Liu, Ke-Tien, 4,689,989, Cl. 73-61.10R.
Bocker, Heinrich: *See*—
Alig, Franz; Bocker, Heinrich; Neulinger, Franz; and Schummer, Helmut, 4,690,694, Cl. 55-4.000.
Boehringer Mannheim GmbH: *See*—
Klose, Sigmar; Pasch, Manfred; Schlumberger, Helmut; Kleemann, Wolfgang; and Vieth, Friedhelm, 4,690,899, Cl. 436-45.000.
Boerema, Edward T.; Suman, Michael J.; and Fleming, Dennis J., to Prince Corporation. Visor system. 4,690,450, Cl. 296-97.00K.
Bogl, Leonhard: *See*—
Mertens, Horst M.; and Bogl, Leonhard, 4,690,098, Cl. 118-727.000.
Bohme, Hans-Joachim: *See*—
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.0SC.
Bohmer, William, to Control Interface Company Limited. Waveforms on a liquid crystal display. 4,690,509, Cl. 350-333.000.
Boisdon, Claude, to Jeumont-Schneider Corporation. Control apparatus for a direct current arc furnace. 4,691,325, Cl. 373-108.000.
Bollard, David R., to U.S. Philips Corporation. Receiver for amplitude modulated signals. 4,691,381, Cl. 455-334.000.
Bolle, Robert, to Etablissements Bolle Georges, Robert et Maurice. Eye shield with face engaging seal. 4,689,837, Cl. 2-440.000.
Bollong, Alan B. L.: *See*—
Bult, Roelof P.; Bollong, Alan B. L.; and Redden, Robert F., 4,690,725, Cl. 156-617.00R.
Bopp, Warren G.; and Janson, David A., to Eaton Corporation. Torsion damping assembly. 4,690,256, Cl. 192-21.000.
Borg-Warner Automotive, Inc.: *See*—
Wang, Ting M., 4,689,953, Cl. 60-330.000.
Borg-Warner Industrial Products, Inc.: *See*—
Miller, Alan L.; and Kozlowski, James L., 4,691,276, Cl. 364-148.000.
Borgonovo, Sergio: *See*—
Bortolin, Bruno; and Borgonovo, Sergio, 4,690,496, Cl. 350-96.210.
Borrod, Guy: *See*—
Chene, Alain; and Borrod, Guy, 4,690,708, Cl. 71-94.000.
Bortolin, Bruno; and Borgonovo, Sergio, to Societa Cavi Pirelli S.p.A. Optical fiber joint with reinforcing filament and method of making such joint. 4,690,496, Cl. 350-96.210.
Bose, Bella; and Lin, Der J., to Bose, Bella. Method and system for detecting a predetermined number of unidirectional errors. 4,691,319, Cl. 371-54.000.
Bosley, Robert W.; Kirshman, Samson; LeMay, Dan B.; and Renken, Wayne G., to Innovus. Electromagnetic valve with permanent magnet armature. 4,690,371, Cl. 251-65.000.
Bouc, Gary L.: *See*—
Daghe, Joseph L.; Humes, Dennis W.; Stanley, Mervin D.; and Bouc, Gary L., 4,690,019, Cl. 81-99.000.
Boudewijns, Arnoldus J. J., to U.S. Philips Corporation. Charge transfer device. 4,691,218, Cl. 357-24.000.
Boussac Saint Freres B. S. F.: *See*—
Lucas, Gerard; Dussaud, Jacques; and Leroy, Andre , 4,690,719, Cl. 156-201.000.
Bouteille, Daniel; Nicolas, Michel; and Guillin, Daniel, to La Telemecanique Electrique. Emergency draining device for stopping pneumatic cylinders. 4,690,035, Cl. 91-442.000.
Bouverot, Noel: *See*—
LaGarde, Robert; and Bouverot, Noel, 4,690,967, Cl. 524-266.000.
Bovino, Lawrence J., to United States of America, Army. Multiple gap optically activated switch. 4,691,111, Cl. 250-551.000.
Bowles, Bobby K.: *See*—
Cole, R. Clay; and Bowles, Bobby K., 4,690,961, Cl. 523-440.000.

Bozung, Hanns-Gunter: *See*—
Schroder, Joachim; Bozung, Hanns-Gunter; Bandel, Rudolf; and Mendle, Hans, 4,689,960, Cl. 60-607.000.

Braathen, Russell E., to Novatel Communications Ltd. Two way telephone communication system. 4,691,348, Cl. 379-389.000.

Braddick, Britt O., to Texas Iron Works, Inc. Tubular member anchoring arrangement and method. 4,690,220, Cl. 166-382.000.

Bradford, John R. Stereo image display device. 4,691,358, Cl. 381-12.000.

Bradisse, John L.; and Lindner, Daniel J., to Goodyear Tire & Rubber Company, The. All-season pneumatic tire with chamfered tread blocks. 4,690,189, Cl. 152-209.00R.

Brady, William T.; Norton, Scott J.; and Ko, Jinrea, to S.C. Johnson & Son, Inc. Process for the preparation of pyrethroid acids. 4,691,052, Cl. 562-506.000.

Bramer, Charles, to Lacks Industries, Inc. Remote control rear view mirror, cable operated. 4,690,013, Cl. 74-501.00M.

Brammall, Terrence N., to Trans-Guard Industries, Inc. Locking device with split collar. 4,690,443, Cl. 292-307.00R.

Branca, Quirico: *See*—
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,691,040, Cl. 558-44.000.

Brandli, Max; and Feldmann, Hansueli, to JD-Technologie AG. Joint for a transversely separated vehicle. 4,690,422, Cl. 280-460.00R.

Branson Ultrasonics Corporation: *See*—
Flood, Gary N., 4,690,722, Cl. 156-510.000.

Braun Aktiengesellschaft: *See*—
Barowski, Karlheinz; and Berghammer, Conrad, 4,691,095, Cl. 219-222.000.

Braymand, Robert, to Societe Nouvelle Baele Gangloff. Rail-tube holder for walking-beam conveyor. 4,690,270, Cl. 198-774.000.

Brede, Uwe; and Kordel, Gerhard, to Dynamit Nobel Aktiengesellschaft. Electric detonator device. 4,690,056, Cl. 102-202.200.

Breneman, William C.; and Reeser, David M., to Union Carbide Corporation. Disposal process for contaminated chlorosilanes. 4,690,810, Cl. 423-335.000.

Bresin, Mark S.: *See*—
Marabotto, Eduardo J.; and Bresin, Mark S., 4,690,471, Cl. 439-63.000.

Brewer, Janet C. Protective device for hair stylist's fingers. 4,689,828, Cl. 2-21.000.

Brezillon, Jean-Loup; and Dauchier, Jean-Michel, to Saft, S.A. Method of manufacturing a polymer-consolidated cadmium electrode for an alkaline storage cell, and an electrode obtained by the method. 4,689,880, Cl. 29-623.500.

Brice, Ronnie V. Collapsible decoy. 4,689,913, Cl. 43-3.000.

Bricker, Jeffery C., to UOP Inc. Dehydrogenation of dehydrogenatable hydrocarbons. 4,691,071, Cl. 585-319.000.

Bridgestone Corporation: *See*—
Hirata, Yasushi; Kondo, Hitoshi; Yokoyama, Goro; and Ohara, Masaki, 4,690,965, Cl. 524-236.000.
Kawasaki, Kiyohito, 4,690,191, Cl. 152-527.000.

Brierley, Corale L.: *See*—
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,690,894, Cl. 435-244.000.

Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., to Advanced Mineral Technologies, Inc. Treatment of microorganisms with alkaline solution to enhance metal uptake properties. 4,690,894, Cl. 435-244.000.

Brinly-Hardy Co., Inc.: *See*—
Doering, Charles W., 4,689,941, Cl. 56-396.000.

Briscoe, Terry L., to Esco Corporation. Rub link assembly for dragline bucket. 4,689,904, Cl. 37-135.000.

Bristol-Myers Company: *See*—
Saitoh, Kyoichiro; Konishi, Masataka; and Tomita, Koji, 4,690,926, Cl. 514-269.000.
Vyas, Dolatrai M.; Chiang, Yulin; and Doyle, Terrence W., 4,691,023, Cl. 548-422.000.

British Aerospace Public Limited Company: *See*—
Albericci, Peter, 4,690,736, Cl. 204-38.300.

British Petroleum Company p.l.c., The: *See*—
Corvazier, Philippe; and Dousteyssier, Jacques, 4,691,113, Cl. 250-577.000.
Wills, Anthony J., 4,690,295, Cl. 220-207.000.

Brochier S.A.: *See*—
Auduc, Herve ; and Aucagne, Jean, 4,690,851, Cl. 428-116.000.

Broussely, Michel: *See*—
Gabano, Jean-Paul; Broussely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, 4,690,877, Cl. 429-194.000.

Brower, Boyd G., to GTE Products Corporation. Side-mounted flashlamps. 4,690,637, Cl. 431-359.000.

Brown, Boveri & Cie AG: *See*—
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.0SC.

Brown, James M. Truck loading apparatus. 4,690,609, Cl. 414-543.000.

Brown, Richard W.; and Ardolf, Duane R., to Aquatrol Corporation. Low-powered remote sensor and telephone line transmitter. 4,691,344, Cl. 379-106.000.

Brownstein, Scott A., to Eastman Kodak Company. Thermal printer. 4,691,211, Cl. 346-76.0PH.

Bruns, Engelbert: *See*—
Walther, Norbert; Lucas, August; Lorenz, Kurt; and Bruns, Engelbert, 4,690,160, Cl. 134-181.000.

Brusewitz, Gerhard; and Sieck, Reiuhard, to Madaus & Co. Device for the determination of micro-organisms. 4,690,896, Cl. 435-296.000.

Bryan, Thomas T.: *See*—
Aasen, Steven M.; and Bryan, Thomas T., 4,691,039, Cl. 556-446.000.

Buckley, B. Shawn; Reichwein, Roy H.; Buckley, Edward M.; and Pinyan, James A., to Cochlea Corporation. Method of and apparatus for inspecting objects using multiple position detectors. 4,690,284, Cl. 209-590.000.

Buckley, Edward M.: *See*—
Buckley, B. Shawn; Reichwein, Roy H.; Buckley, Edward M.; and Pinyan, James A., 4,690,284, Cl. 209-590.000.

Buckley, John E., to Securistyle Limited. Friction supported stays for windows. 4,689,852, Cl. 16-341.000.

Bugiel, Horst G., to Diehl GmbH & Co. Warhead, especially for the attacking of radar installations. 4,690,062, Cl. 102-476.000.

Buhrer, Carl F.; and Feuersanger, Alfred E., to GTE Laboratories Incorporated. Dosing composition for high pressure sodium lamps. 4,691,141, Cl. 313-565.000.

Bult, Roelof P.; Bollong, Alan B. I.; and Redden, Robert F., to Cominco Ltd. Purification of Cd and Te by zone refining. 4,690,725, Cl. 156-617.00R.

Bum, Choi W.: *See*—
Hyun, Choi J.; Chul, Lee J.; and Bum, Choi W., 4,691,106, Cl. 250-349.000.

Buma, Shuuichi, to Toyota Jidosha Kabushiki Kaisha. Air suspension. 4,690,430, Cl. 280-708.000.

Buma, Shuuichi: *See*—
Asami, Ken; Onuma, Toshio; Ohashi, Kaoru; and Buma, Shuuichi, 4,690,429, Cl. 280-707.000.

Bumbaca, Domenic J.: *See*—
Bernazzani, Richard J.; and Bumbaca, Domenic J., 4,689,886, Cl. 30-416.000.

Burger, Raymond: *See*—
Sauer, Claude; Burger, Raymond; Reguigne, Gabriel; and Kern, Mark, 4,690,874, Cl. 428-537.100.

Burgoyne, William F., Jr.: *See*—
Pinschmidt, Robert K., Jr.; Dixon, Dale D.; and Burgoyne, William F., Jr., 4,691,026, Cl. 548-531.000.

Burlington Industries, Inc.: *See*—
Lassiter, B. Dean; and Ambrosiani, Vincent F., 4,690,847, Cl. 428-71.000.

Burns, Joseph E. Resealable envelope. 4,690,322, Cl. 229-80.000.

Burns, Lyle D.; and Stahl, G. Allan, to Phillips Petroleum Company. Acidizing using n-vinyl lactum/unsaturated amide copolymers. 4,690,219, Cl. 166-307.000.

Burroughs Wellcome Co.: *See*—
Coker, Geoffrey G.; and Findlay, John W. A., 4,690,933, Cl. 514-343.000.

Burst, Hermann: *See*—
Reichel, Anton; Lohmann, Bernard; Kolb, Eugen; Hochkonig, Manfred; Burst, Hermann; and Kretschmer, Helmut, 4,690,204, Cl. 165-44.000.

Burstein, Paul; Krieger, Allen; Annis, Martin; and Chase, Richard C., to American Science and Engineering, Inc. High energy computed tomography. 4,691,332, Cl. 378-7.000.

Butterworth Jetting Systems, Inc.: *See*—
Pacht, Amos, 4,690,325, Cl. 239-124.000.

C-D Marketing, Ltd.: *See*—
Jacob, Keith D., 4,690,508, Cl. 350-331.00R.

C-I-L Inc.: *See*—
Mohanty, Bibhuti B., 4,690,058, Cl. 102-312.000.

C-Lock Retention Systems, Inc.: *See*—
Berger, Lawrence E., 4,690,588, Cl. 405-262.000.

C. R. Bard, Inc.: *See*—
McGreevy, Francis T.; and Hahn, Karl W., 4,690,684, Cl. 623-12.000.

Cabe, Alex W., Jr.: *See*—
Mattingly, William B., III; Cabe, Alex W., Jr.; Chapas, Richard B.; and Sampson, Arthur J., Jr., 4,690,679, Cl. 604-383.000.

Caldwell Co., Inc., The: *See*—
Hauser, Thomas A., 4,689,859, Cl. 24-233.000.

Caldwell Manufacturing Company: *See*—
Flight, Robert S., 4,689,850, Cl. 16-197.000.

California Institute of Technology: *See*—
Grubbs, Robert H.; Gilliom, Laura R.; and Siove, Alain, 4,690,992, Cl. 526-160.000.

Callut, Francois; and Demeuldre, Daniel, to Marginvest S.A. Holding. Process for the preparation of an absorbing and adsorbing agent; and the product produced therefrom. 4,690,914, Cl. 502-400.000.

Calpis Food Industry Co., Ltd., The: *See*—
Inagami, Kaoru; and Kikuchi, Noboru, 4,691,011, Cl. 530-832.000.
Yamane, Kunio; Ohmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, 4,690,898, Cl. 435-320.000.

Calver, John G.; Pearce, Phillip W.; and Zielinski, Erich, to Eastman Kodak Company. Semiconductor mounting assembly. 4,691,265, Cl. 361-386.000.

Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., to Molins PLC. Conveying apparatus for rod-like articles. 4,690,604, Cl. 414-403.000.

Cambridge Instruments GmbH: *See*—
Behme, Werner; and Berleth, Manfred, 4,691,151, Cl. 318-571.000.

Cambridge Instruments Inc.: *See*—
Berleth, Manfred; and Weinhold, Helmut, 4,690,023, Cl. 83-700.000.

Cameron, Kenneth A. Horse shoe. 4,690,222, Cl. 168-4.000.
Campbell, Michael: *See—*
Roll, Walter F.; and Campbell, Michael, 4,690,486, Cl. 350-6.600.
Canadian Patents and Development Limited: *See—*
Haard, Norman F.; and Patel, Thakor R., 4,690,826, Cl. 426-36.000.
Canfield, Dennis R.: *See—*
Asiesen, Kerby S.; Bocek, John R.; Canfield, Dennis R.; and Liu, Ke-Tien, 4,689,989, Cl. 73-61.10R.
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., to Energy Conversion Devices, Inc. Contact-type document scanner including protective coating. 4,691,243, Cl. 358-294.000.
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., to Energy Conversion Devices, Inc. Contact-type document scanner including static shield. 4,691,244, Cl. 358-294.000.
Cannon, David C., to Sonoco Products Company. Bulk carbonated beverage container. 4,690,299, Cl. 220-402.000.
Canon Kabushiki Kaisha: *See—*
Hasegawa, Shizuo; and Hayashi, Kimiyoshi, 4,691,114, Cl. 250-578.000.
Iizuka, Toshimi; and Kamata, Shigeru, 4,690,505, Cl. 350-252.000.
Inaba, Yutaka; and Ando, Yujiro, 4,691,213, Cl. 346-159.000.
Ito, Yuji, 4,690,561, Cl. 356-339.000.
Kamata, Shigeru; and Iizuka, Toshimi, 4,690,514, Cl. 350-429.000.
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,690,532, Cl. 354-173.110.
Kobayashi, Kazunobu; Sekiguchi, Kyoji; Matsumura, Isao; and Madate, Haruhisa, 4,690,525, Cl. 351-206.000.
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,691,256, Cl. 360-73.000.
Nagashima, Nao, 4,691,365, Cl. 382-54.000.
Shimizu, Haruo, 4,691,237, Cl. 358-256.000.
Suzuki, Hideyuki; Terada, Katsunori; Masaki, Yuichi; and Morimoto, Kenji, 4,690,880, Cl. 430-313.000.
Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,690,513, Cl. 350-427.000.
Ueda, Hiroyuki; and Kobata, Yoshihiro, 4,690,575, Cl. 400-166.000.
Cantrell, C. D.; and Peterson, G. L., to Board of Regents, The University of Texas System. Method and apparatus for laser isotope separation. 4,690,742, Cl. 204-157.200.
Cantrell Machine Co.: *See—*
Dameron, Woodal W., 4,689,855, Cl. 17-11.000.
Cape Cod Research, Inc.: *See—*
Walsh, Myles A., III; and Morris, R. Scott, 4,690,741, Cl. 204-149.000.
Cappel, Bert; Knapp, Karl L.; and Jung, Adolf, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Sheet feed drum for rotary presses. 4,690,054, Cl. 101-409.000.
Car-O-Liner Company: *See—*
Bergstrom, Hans R., 4,690,250, Cl. 187-18.000.
Carl Hurth Maschinen-und Zahnradfabrik Gmbh & Co.: *See—*
Loos, Herbert; and Erhardt, Manfred, 4,689,918, Cl. 51-105.0GG.
Carl Still GmbH & Co. KG, Firma: *See—*
Walther, Norbert; Lucas, August; Lorenz, Kurt; and Bruns, Engelbert, 4,690,160, Cl. 134-181.000.
Carl-Zeiss-Stiftung: *See—*
Daniels, Erwin J.; and Korn, Siegfried, 4,690,524, Cl. 351-168.000.
Kuhne, Christoph, 4,690,550, Cl. 356-5.000.
Carlson, David E.: *See—*
Dickson, Charles R.; and Carlson, David E., 4,690,830, Cl. 427-38.000.
Carlsson, Gengt, to AB BOFORS. High velocity projectile. 4,690,057, Cl. 102-266.000.
Carminati, Paolo: *See—*
Nisato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, 4,691,019, Cl. 546-330.000.
Carrell, Ross M., to RCA Corporation. Parcel sorting apparatus. 4,690,283, Cl. 209-549.000.
Carrio, Pierre, to Coflexip. Apparatus to transfer fluid between a fixed structure and a rotatable structure by using at least one flexible conduit. 4,690,181, Cl. 141-388.000.
Carris, George M., to Westinghouse Electric Corp. Terminal base assembly for meter sockets. 4,690,483, Cl. 439-517.000.
Carrow, Guy E., to Phillips Petroleum Company. Method and apparatus for molding hollow articles. 4,690,632, Cl. 425-429.000.
Carson, Paul L.; and Detsch, Richard M., to University of Michigan, The. Variable frequency gas-bubble-manipulating apparatus and method. 4,689,986, Cl. 73-19.000.
Carter, David C. M.: *See—*
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., 4,690,604, Cl. 414-403.000.
Cartwright, John S., to American Telephone and Telegraph Company, AT&T Technologies, Inc. Methods for transferring spring clips. 4,689,866, Cl. 29-426.600.
Case Vibromax GmbH & Co KG: *See—*
Lietzke, Heinz, 4,689,955, Cl. 60-420.000.
Casma di V. Marinoni & Figli: *See—*
Marinoni, Mario, 4,689,853, Cl. 16-382.000.
Castagna, Wolfgang; Krankenhagen, Jochen; Ortwein, Heinz; and Weertz, Klaus, to awfi Arbeitswissenschaffliches Forschungsinstitut GmbH. Sewing machine. 4,690,081, Cl. 112-276.000.
Castaldi, John; and Greenzang, Fred, to Applied Retrieval Technology, Inc. Automatic storage and retrieval system. 4,690,602, Cl. 414-282.000.
Castech Enterprises, Inc.: *See—*
Hardey, Donald H.; and Austin, Franklin D., 4,690,198, Cl. 164-316.000.
Castel, Joelle H.: *See—*
Paradowski, Henri; Castel, Joelle H.; and Parfait, Herve B., 4,690,702, Cl. 62-23.000.
Castel, John C.; and Kerwin, Richard G. Fresnel lens light applicator. 4,690,141, Cl. 128-396.000.
Catallo, Frank. Method and apparatus for the compressive treatment of fabric. 4,689,862, Cl. 26-18.600.
Caterpillar Industrial Inc.: *See—*
Baumgartner, Kenneth A.; and Pickering, William, 4,691,149, Cl. 318-331.000.
Fotheringham, James R., 4,690,610, Cl. 414-631.000.
Tupman, David J., 4,691,385, Cl. 455-607.000.
Cation Corporation: *See—*
Vishnitsky, Alexander, 4,690,737, Cl. 204-129.700.
Cavanaugh, James E.; Erwin, Larry; and Hetherington, Robert D., to Binks Manufacturing Company. Pail mount pump with integral cover. 4,690,308, Cl. 222-156.000.
Cella, James A.; Grade, Marsha M.; and Evans, Thomas L., to General Electric Company. Flame retardant wire coating compositions. 4,690,997, Cl. 528-26.000.
Central Glass Company, Limited: *See—*
Inoue, Fumio; Katsuhara, Yutaka; and Okazaki, Koshi, 4,691,066, Cl. 570-144.000.
Ceraver: *See—*
Gissinger, Patrick; and Poutignat, Yves, 4,690,630, Cl. 425-236.000.
Ceskoslovenska akademie ved: *See—*
Kolinsky, Miloslav; Jisova, Vaclava; and Babka, Josef, 4,690,989, Cl. 526-88.000.
Cetus Corporation: *See—*
Loor, Rueyming; M'Timkulu, Thabiso; and DeWitt, Susanne K., 4,690,890, Cl. 435-7.000.
Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., to S&C Electric Company. Insulating material and use thereof in insulators. 4,690,780, Cl. 252-572.000.
Chaconas, Peter C., to Black & Decker Inc. Saw blade and tip therefor. 4,690,024, Cl. 83-852.000.
Chalfin, Edward, to Sprague Electric Company. Circuit for protecting a power transistor against a short-circuited load. 4,691,262, Cl. 361-56.000.
Chamberland, Roger R.; and Stanland, Andrew J., to United States of America, Navy. High frequency, hermetic, coaxial connector for flexible cable. 4,690,482, Cl. 439-578.000.
Chambers, Robert W.: *See—*
Draft, Howard J.; and Chambers, Robert W., 4,689,835, Cl. 2-424.000.
Chamblee, Henry F. Snap ring tool. 4,689,865, Cl. 29-229.000.
Champion International Corporation: *See—*
Alexander, Garold W.; Hyder, Lonnie E.; and Wright, Robert V., 4,690,666, Cl. 493-152.000.
Costa, Robert E., 4,691,369, Cl. 383-17.000.
Changle, Joseph F.: *See—*
Grunert, Kurt A.; and Changle, Joseph F., 4,691,180, Cl. 335-6.000.
Chapas, Richard B.: *See—*
Mattingly, William B., III; Cabe, Alex W., Jr.; Chapas, Richard B.; and Sampson, Arthur J., Jr., 4,690,679, Cl. 604-383.000.
Chapman, Robert E., to Optimil Machinery, Inc. Log feed apparatus. 4,690,186, Cl. 144-176.000.
Charbonneau & Godfrey Associates: *See—*
McNennamy, John A.; and Nafziger, Steven, 4,690,003, Cl. 73-862.320.
Charles of the Ritz Group Ltd.: *See—*
Deckner, George E., 4,690,815, Cl. 424-9.000.
Puchalski, Eugene, Jr.; Schneider, Emil F.; Cohee, Judith A.; and El-Menshawy, El-Sayed, 4,690,818, Cl. 424-70.000.
Charmilles Technologies S.A.: *See—*
Balleys, Francois, 4,691,089, Cl. 219-69.00W.
Chartrain, Jean-Claude: *See—*
Mortier, Guy; and Chartrain, Jean-Claude, 4,690,596, Cl. 409-143.000.
Chase, Richard C.: *See—*
Burstein, Paul; Krieger, Allen; Annis, Martin; and Chase, Richard C., 4,691,332, Cl. 378-7.000.
Chateau, Fernand, to Compagnie Generale des Etablissements Michelin. Device and method for assembling threads. 4,689,942, Cl. 57-58.360.
Chattanooga Corporation: *See—*
Alon, Gad, 4,690,146, Cl. 128-422.000.
Chauvin, Yves: *See—*
Hugues, Francois; Commereuc, Dominique; and Chauvin, Yves, 4,691,048, Cl. 560-240.000.
Chavarria, Randy. V-snip scissors. 4,689,884, Cl. 30-229.000.
Chemische Werke Huels Aktiengesellschaft: *See—*
Feinauer, Roland; and Jadamus, Hans, 4,690,970, Cl. 524-504.000.
Chen, Kun-Nau: *See—*
Kant, Rajni; and Chen, Kun-Nau, 4,691,161, Cl. 324-73.00R.
Chen-Liang, Cheng, to Chen Liang Co., Ltd. Superminiature camera. 4,690,534, Cl. 354-187.000.
Chen Liang Co., Ltd.: *See—*
Chen-Liang, Cheng, 4,690,534, Cl. 354-187.000.
Chen, Nai Y.; and Miale, Joseph N., to Mobil Oil Corporation. Process for preparing organic fuels and chemicals from biomass. 4,690,903, Cl. 435-161.000.

Chene, Alain; and Borrod, Guy, to Rhone-Poulenc Agrochimie. Herbicides derived from aryloxybenzenecarboxylic acid imides. 4,690,708, Cl. 71-94.000.

Cheraso, John: *See*—
Woodford, Timothy; and Cheraso, John, 4,690,154, Cl. 128-765.000.

Chesebrough-Pond's, Inc.: *See*—
Engle, Elbert, 4,690,393, Cl. 271-4.000.
Vishnupad, Mohan; and Ramirez, Jose E., 4,690,774, Cl. 252-309.000.

Chevron Research Company: *See*—
Aslesen, Kerby S.; Bocek, John R.; Canfield, Dennis R.; and Liu, Ke-Tien, 4,689,989, Cl. 73-61.10R.

Chiang, Yulin: *See*—
Vyas, Dolatrai M.; Chiang, Yulin; and Doyle, Terrence W., 4,691,023, Cl. 548-422.000.

Chiso, Wen B.: *See*—
Shih, Yen-Jer; Tsai, John (Ji-Hsiung); Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., 4,690,996, Cl. 527-312.000.

Chiba, Akio: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hirosi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio, 4,690,793, Cl. 376-136.000.

Chiba, Yoshinori; Ishida, Keiichi; and Sugiura, Fumio, to Aisin Seiki Kabushiki Kaisha; Toyota Jidosha Kabushiki Kaisha; and Kanto Jidosha Kogyo Kabushiki Kaisha. Air bag assembly. 4,690,456, Cl. 297-284.000.

Chicosky, Leon, Jr.: *See*—
Orr, Robert B.; and Chicosky, Leon, Jr., 4,690,953, Cl. 521-65.000.

Chida, Tsuneaki: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.

Chief Automotive Systems, Inc.: *See*—
Aldrich, Roger B.; and White, Gary R., 4,689,888, Cl. 33-288.000.

Chien, Yie W.; and Tojo, Kakuji, to Rutgers, the State University of New Jersey. Transdermal varapamil delivery device. 4,690,683, Cl. 604-896.000.

Chiesi Farmaceutici S.p.A.: *See*—
Chiesi, Paolo; and Servadio, Vittorino, 4,690,944, Cl. 514-445.000.

Chiesi, Paolo; and Servadio, Vittorino, to Chiesi Farmaceutici S.p.A. Homocysteine thiolactone derivatives, process for the preparation thereof and pharmaceutical compositions therefrom. 4,690,944, Cl. 514-445.000.

Chiodini, Laura: *See*—
Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; and Salvati, Patricia, 4,690,929, Cl. 514-288.000.

Cho, Masa..aichi: *See*—
Tomohisa, Kunio; Maeda, Kiyoshi; and Cho, Masamichi, 4,691,241, Cl. 358-293.000.

Cho, Shoji, to Life Environment Research Laboratories. Circular sporting article. 4,690,401, Cl. 272-137.000.

Choate, Paul V.; and Woodburn, Robert W., to N I Industries. Front sight for projectile launchers. 4,689,910, Cl. 42-100.000.

Cholnoky, Eszter: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

Christensen, Joel R., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,690,705, Cl. 71-90.000.

Chrzanowski, Mathew: *See*—
Poncy, Richard P.; and Chrzanowski, Mathew, 4,690,457, Cl. 297-337.000.

Chufistov, Sergei A.: *See*—
Tupitsyn, Konstantin K.; Tupitsyn, Sergei K.; Kostylev, Alexandr D.; Kamensky, Veniamin V.; and Chufistov, Sergei A., 4,690,225, Cl. 173-116.000.

Chugai Seiyaku Kabushiki Kaisha: *See*—
Mori, Takashi; Ohi, Nobuhiro; Ohsugi, Yoshiyuki; and Yamashita, Yasuhiro, 4,691,018, Cl. 546-309.000.

Chul, Lee J.: *See*—
Hyun, Choi J.; Chul, Lee J.; and Bum, Choi W., 4,691,106, Cl. 250-349.000.

Chung, Alfred: *See*—
Ryan, James W.; and Chung, Alfred, 4,690,937, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,690,938, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,690,939, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,690,940, Cl. 514-362.000.

Chung, Bong-Kwan, to Sam Sung Electronics Co., Ltd. Rotary coupling for rotatively connecting a feeder line to a rod antenna. 4,690,473, Cl. 439-1.000.

Church, Mark A., to International Business Machines Corp. Method and apparatus for controlling the throat height of batch fabricated thin film magnetic transducers. 4,689,877, Cl. 29-603.000.

Churchward, Reed R.; and Krocheski, Thomas L., to Sperry Corporation. Refresh system for multi-bank semiconductor memory. 4,691,303, Cl. 365-222.000.

CIBA-GEIGY AG: *See*—
Shawcross, Brian E., 4,690,547, Cl. 355-72.000.

Ciba-Geigy Corporation: *See*—
Behrens, Rudolf A.; and Seltzer, Raymond, 4,691,015, Cl. 544-198.000.
Evans, Samuel, 4,691,044, Cl. 560-75.000.
Fory, Werner; Gass, Karl; and Meyer, Willy, 4,690,707, Cl. 71-93.000.
Frick, Willy; Meyer, Alfred; and Nyfeler, Robert, 4,690,942, Cl. 514-383.000.
Staheli, Theodor, 4,690,306, Cl. 222-80.000.
Stegmann, Werner, 4,691,058, Cl. 568-316.000.
Vost, Harald; and Rothweiler, Herbert, 4,690,927, Cl. 514-282.000.

Ciosek, Bernard M., Jr.: *See*—
Zebley, Raymond S.; Nichols, James H., Jr.; and Ciosek, Bernard M., Jr., 4,690,302, Cl. 221-11.000.

Citizen Watch Co., Ltd.: *See*—
Fukuzawa, Takahiko; and Kitahara, Kiyoshi, 4,691,364, Cl. 382-41.000.
Watanabe, Haruo, 4,690,511, Cl. 350-339.00F.

Clarion Co., Ltd.: *See*—
Hasegawa, Isao; Yoshikawa, Kikuo; Takagi, Satoshi; and Takahashi, Akira, 4,691,261, Cl. 360-137.000.
Tsuchiya, Masahiro, 4,691,326, Cl. 375-1.000.

Clark, James A.; and Emmel, Henry J., to Bausch & Lomb Incorporated. Zoom microscope having a crank and linkage mechanism. 4,690,519, Cl. 350-515.000.

Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., to International Business Machines Corporation. Composition, coated article and method of coating. 4,690,962, Cl. 524-94.000.

Clark, Stephen C., to Strippit/Di-Acro-Houdaille, Inc. Automatic load unload turret punch. 4,690,021, Cl. 83-71.000.

Clark, Thomas R. Locator and fixture assembly. 4,689,891, Cl. 33-529.000.

Clarke, John: *See*—
Flesher, Peter; Clarke, John; and Marshall, David, 4,690,971, Cl. 524-555.000.

Clarke, Peter A.: *See*—
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., 4,690,604, Cl. 414-403.000.

Clarke, Thomas C.; Lu, Neng H.; Tomkiewicz, Yaffa; and Tong, Ho M., to International Business Machines Corp. Process for the production of void-free prepreg sheets. 4,690,836, Cl. 427-299.000.

Clausen, Earl W.: *See*—
Hubbard, Lloyd C.; and Clausen, Earl W., 4,690,002, Cl. 73-861.250.

Cloke, Robert L., to Priam Corporation. Data processing system including encoder, decoder and write precompensator, using run length limited code. 4,691,254, Cl. 360-45.000.

Clorox Company, The: *See*—
Baker, Harold R.; Thrower, Eugene S.; and Simpson, David C., 4,690,779, Cl. 252-546.000.

Coad, Brian C., to GTE Products Corporation. Sintered compact and process for producing same. 4,690,711, Cl. 75-244.000.

Coccaro, Albert V. Apparatus for jacking and dollying an affixed vehicle wheel assembly. 4,690,605, Cl. 414-429.000.

Cochles Corporation: *See*—
Buckley, B. Shawn; Reichwein, Roy H.; Buckley, Edward M.; and Pinyan, James A., 4,690,284, Cl. 209-590.000.

Coflexip: *See*—
Carrio, Pierre, 4,690,181, Cl. 141-388.000.

Cohee, Judith A.: *See*—
Puchalski, Eugene, Jr.; Schneider, Emil F.; Cohee, Judith A.; and El-Menshawy, El-Sayed, 4,690,818, Cl. 424-70.000.

Coker, Geoffrey G.; and Findlay, John W. A., to Burroughs Wellcome Co. Pyridylvinyl-1H tetrazole having antihistamine activity. 4,690,933, Cl. 514-343.000.

Colditz, Armin; and Klopsch, Siegfried, to Dr. Ing. Rudolf Hell GmbH. Apparatus for checking color pictures on a color monitor. 4,691,229, Cl. 358-76.000.

Cole-Parmer Instrument Company: *See*—
Hogan, Lawrence R., 4,690,307, Cl. 222-95.000.

Cole, R. Clay; and Bowles, Bobby K., to Halliburton Company. Sealant composition. 4,690,961, Cl. 523-440.000.

Coleman Company, Inc., The: *See*—
Schmidt, Frank T., 4,691,136, Cl. 310-339.000.

Coleman, Mary T.; and Tasbas, Hedy E. Lubricated tampon inserter. 4,690,671, Cl. 604-12.000.

Colgate-Palmolive Company: *See*—
Ouhadi, Trazollah; and Dehan, Louis, 4,690,771, Cl. 252-102.000.

Collart, Andre ; and Declerck, Fredy, to Solvay & Cie. (Societe Anonyme). Oxymethylene copolymers and process for their preparation. 4,691,000, Cl. 528-244.000.

Columbia Gas System Service Corp.: *See*—
Malcosky, Norman D.; and Koziar, Gregory, 4,690,689, Cl. 48-174.000.

Colvin, Richard. Archery sight. 4,689,887, Cl. 33-265.000.

Combs Enterprises, Inc.: *See*—
Everman, Wayne H.; and Gilbert, Joseph H., 4,690,732, Cl. 202-100.000.

Combustion Engineering, Inc.: *See*—
Peletz, Lawrence J., Jr.; and Jukkola, Glen D., 4,690,076, Cl. 110-347.000.

Cominco Ltd.: *See*—
Bult, Roelof P.; Bollong, Alan B. I.; and Redden, Robert F., 4,690,725, Cl. 156-617.00R.

Comm/Scope Company: *See*—
Gupta, Chakra V.; and Garrett, Brian D., 4,691,081, Cl. 174-105.00R.

Commereuc, Dominique: *See—*
Hugues, Francois; Commereuc, Dominique; and Chauvin, Yves, 4,691,048, Cl. 560-240.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Banks, Henry J.; and Wiseman, John R., 4,690,041, Cl. 98-57.000.
Coogan, Clive K., 4,690,560, Cl. 356-338.000.
Compagnie Francaise d'Etudes et de Construction "Technip" : *See—*
Paradowski, Henri; Castel, Joelle H.; and Parfait, Herve B., 4,690,702, Cl. 62-23.000.
Compagnie Generale des Etablissements Michelin: *See—*
Chateau, Fernand, 4,689,942, Cl. 57-58.360.
Compagnie Gervais Danone: *See—*
Berthet, Maurice, 4,690,281, Cl. 206-597.000.
Conboy, Leo W., to Ford Aerospace & Communications Corporation. High frequency, wide range FIR filter. 4,691,293, Cl. 364-724.000.
Conlogue, James H.; and Banker, Henry, to Hoof Products Co. Engine governor. 4,690,115, Cl. 123-366.000.
Constantin, Bruce J. Wheelchair restraining device. 4,690,364, Cl. 248-503.100.
Conti, Gianni: *See—*
Conti, Paolo; Conti, Gianni; Gariboldi, Franco; and Manini, Benito, 4,689,971, Cl. 66-25.000.
Conti, Paolo; Conti, Gianni; Gariboldi, Franco; and Manini, Benito, to Conti, Paolo; and Meritex S.r.l. Process and circular knitting machine for manufacturing pantyhose articles and the like. 4,689,971, Cl. 66-25.000.
Control Interface Company Limited: *See—*
Bohmer, William, 4,690,509, Cl. 350-333.000.
Conway, Hugh T.: *See—*
Losada, Robert J.; and Conway, Hugh T., 4,690,153, Cl. 128-763.000.
Coogan, Clive K., to Commonwealth Scientific and Industrial Research Organization. Optically based measurement of fluid parameters. 4,690,560, Cl. 356-338.000.
Coons, Robert A., Jr., to Xerox Corporation. Envelope configuration for use in a high speed copier with envelope printing capability. 4,690,392, Cl. 271-2.000.
Cooper Cliff Door Manufacturing (1980) Ltd : *See—*
Taylor, Douglas B., 4,690,195, Cl. 160-310.000.
Cooper Industries, Inc.: *See—*
Urani, Angelo, 4,690,648, Cl. 439-622.000.
Cope, Inc.: *See—*
Koperdak, Edward A., 4,690,382, Cl. 256-1.000.
Copeland, James L., to Ecolab Inc. Solid block chemical dispenser for cleaning systems. 4,690,305, Cl. 222-52.000.
Coppelmans, Petrus M. C.: *See—*
Van Roermund, Arthur H. M.; and Coppelmans, Petrus M. C., 4,691,171, Cl. 328-167.000.
Coppin, William, to Maxon Corporation. High temperature burner assembly. 4,690,635, Cl. 431-187.000.
Cordis Corporation: *See—*
Hess, Stanley R., 4,690,148, Cl. 128-639.000.
Hess, Stanley R., 4,690,155, Cl. 128-786.000.
Schroeppel, Edward A., 4,690,143, Cl. 128-419.00P.
Cork, William H.: *See—*
Wirstrom, Peter; and Cork, William H., 4,691,355, Cl. 380-23.000.
Cornell, David D.: *See—*
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,691,050, Cl. 562-406.000.
Corominas, Narciso L., to Metalquimia, S.A. Injecting machine for meat pieces. 4,690,046, Cl. 99-533.000.
Corvazier, Philippe; and Dousteyssier, Jacques, to British Petroleum Company p.l.c., The. Level indicator for a liquid in a container. 4,691,113, Cl. 250-577.000.
Cory, John S. Automatic ribbon re-inker. 4,690,576, Cl. 400-200.000.
Costa, Robert E., to Champion International Corporation. Bag with handle and method of making the same. 4,691,369, Cl. 383-17.000.
Costar Corporation: *See—*
Mathus, Gregory; Lyman, George; and Looney, Kevin, 4,690,757, Cl. 210-232.000.
Cotey, John. Portable dispenser for rolled paper products. 4,690,345, Cl. 242-55.530.
Cotteret, Jean: *See—*
Grollier, Jean-Francois; Cotteret, Jean; Junino, Alex; and Genet, Alain, 4,690,685, Cl. 8-405.000.
Courty, Albert: *See—*
Eumurian, Gregoire; and Courty, Albert, 4,691,386, Cl. 455-607.000.
Couvez, Marc, to Societe Anonyme D.B.A. Pad spring for a disc brake with a sliding caliper, and disc brake equipped with such a spring. 4,690,254, Cl. 188-73.360.
Cox, Eugene R., to Harris Corporation. Method to reduce the height of the bird's head in oxide isolated processes. 4,691,222, Cl. 357-50.000.
CPC International Inc.: *See—*
Urbas, Branko, 4,691,055, Cl. 562-589.000.
Craft House Corporation: *See—*
DeLaney, George E., 4,690,654, Cl. 446-28.000.
Crain, Steven P.: *See—*
Wang, Pen C.; Stuart, Van I. W.; Yates, Ronald L.; and Crain, Steven P., 4,691,021, Cl. 548-309.000.
Craneveyor Corp.: *See—*
Batcheller, Roy W., 4,690,383, Cl. 256-24.000.
Crapser, James R.; and Demarest, Scott W., to S. C. Johnson & Son, Inc. Dual function cap. 4,690,312, Cl. 222-402.170.
Creative Products Resource Associates, Ltd.: *See—*
Smith, James A.; and Murphy, Betty J., 4,690,821, Cl. 424-401.000.
Crews, Purvis J.: *See—*
Bailey, Randal N.; and Crews, Purvis J., 4,690,455, Cl. 297-238.000.
Cringle, David C.; Pearce, Roscoe L.; and DuPart, Michael S., to Dow Chemical Company, The. Method for maintaining effective corrosion inhibition in gas scrubbing plant. 4,690,740, Cl. 204-147.000.
Crisafulli, Emilio: *See—*
Nisato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, 4,691,019, Cl. 546-330.000.
Croman, Stanley W. T.; Jordan, Janet M.; and Paukovits, Edward J., Jr., to AMP Incorporated. Belt conveyor having article sorting and orienting features. 4,690,266, Cl. 198-388.000.
Crosson, Peter; Sanchez, Terry; Gray, Kevin; and Goldstein, Samuel M., to Mattel, Inc. Toy car launcher with expandable scissors members. 4,690,658, Cl. 446-429.000.
Crowter, Ronald H.: *See—*
Gregan, David J.; and Crowter, Ronald H., 4,690,099, Cl. 119-14.410.
CTS Corporation: *See—*
Waldron, Mark A.; and Leung, Tommy Y., 4,691,342, Cl. 379-98.000.
Daewoo Heavy Industries Ltd.: *See—*
Hyun, Choi J.; Chul, Lee J.; and Bum, Choi W., 4,691,106, Cl. 250-349.000.
Daghe, Joseph L.; Humes, Dennis W.; Stanley, Mervin D.; and Bouc, Gary L., to Mueller Co. Operating wrench for tamperproof hydrants. 4,690,019, Cl. 81-99.000.
Dahlquist, Håkan; and Kaufmann, Herbert, to ASEA Aktiebolag. Robot wrist. 4,690,012, Cl. 74-479.000.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,690,788, Cl. 264-22.000.
Daicel Chemical Industries, Ltd.: *See—*
Yamane, Kunio; Ohmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, 4,690,898, Cl. 435-320.000.
Daido, Toshihiko, to Koyo Seiko Co., Ltd. Steering power control system in electronically controlled steering system. 4,690,233, Cl. 180-142.000.
Daiichi Denshi Kogyo Kabushiki Kaisha: *See—*
Hirose, Takao; and Kumekawa, Norio, 4,690,494, Cl. 350-96.200.
Daiichi Pure Chemicals Co., Ltd.: *See—*
Hibino, Mitsugu; Kanada, Taira; and Hirata, Miyoshi, 4,690,907, Cl. 436-514.000.
Daikin Kogyo Co., Ltd.: *See—*
Ohmori, Akira; and Ishiwari, Kazuo, 4,690,869, Cl. 428-421.000.
Dainichi-Nippon Cables, Ltd.: *See—*
Hayami, Hiroyuki; and Utsumi, Atsushi, 4,690,500, Cl. 350-96.250.
Dainippon Ink and Chemicals, Inc.: *See—*
Mitani, Tomomasa; and Mihata, Ichiro, 4,690,968, Cl. 524-315.000.
Sakakibara, Shigeru; Arimoto, Shunji; Ishikawa, Hidenobu; and Maruyama, Osamu, 4,690,987, Cl. 525-502.000.
Dainippon Screen Mfg. Co., Ltd.: *See—*
Kurusu, Yasuo; and Morizumi, Yoshiaki, 4,691,240, Cl. 358-282.000.
Ohtorii, Masakazu, 4,690,527, Cl. 353-65.000.
Tomohisa, Kunio; Maeda, Kiyoshi; and Cho, Masamichi, 4,691,241, Cl. 358-293.000.
Yamada, Mitsuhiko, 4,691,238, Cl. 358-280.000.
Daiwa Special Chemical Co., Ltd.: *See—*
Yamada, Yosuke; and Oogami, Mitsuhiro, 4,690,158, Cl. 134-107.000.
Dalglish, Herbert F. Intravenous tube assembly. 4,690,674, Cl. 604-93.000.
Dalo, Jean; and Dalo, Pierre. Method and device for mounting the pole and cloth of a light shelter with central pole. 4,690,161, Cl. 135-99.000.
Dalo, Pierre: *See—*
Dalo, Jean; and Dalo, Pierre, 4,690,161, Cl. 135-99.000.
Daltex Medical Sciences, Inc.: *See—*
Erb, Robert A., 4,690,677, Cl. 604-329.000.
Dalton, Martin W., to Triton Aquatherm Limited. Automatically adjustable shower head to maintain constant pressure spray. 4,690,334, Cl. 239-452.000.
Dameron, Woodal W., to Cantrell Machine Co. Poultry line divider. 4,689,855, Cl. 17-11.000.
Damiano, Michael A.; and Schmerda, Richard F., to Eaton Corporation. Blown fuse indicator. 4,691,197, Cl. 340-638.000.
Damon Biotech, Inc.: *See—*
Lim, Franklin, 4,690,682, Cl. 604-891.000.
Danagraf A/S: *See—*
Holm, Niels E., 4,690,548, Cl. 355-77.000.
Dane, Bernard: *See—*
Lemonnier de Gouville, Jean B.; and Dane, Bernard, 4,690,636, Cl. 431-354.000.
Danfoss A/S: *See—*
McCulloch, Robert M.; and Jorgensen, Ove, 4,689,968, Cl. 62-225.000.
Dang, Hiep D.: *See—*
Beaver, Richard N.; Morris, Gregory J.; Pimlott, John R.; and Dang, Hiep D., 4,690,748, Cl. 204-279.000.
Daniels, Erwin J.; and Korn, Siegfried, to Carl-Zeiss-Stiftung. Multifocal spectacle lens having a large near-vision part. 4,690,524, Cl. 351-168.000.
Daniels, Jerry. Weight lifting belt. 4,689,833, Cl. 2-322.000.

Danilenko, Michael; Rusterholz, John T.; and Lahti, Archie E., to Unisys Corporation. Instruction buffer for a digital data processing system. 4,691,279, Cl. 364-200.000.

Dannels, Bobby F., to Occidental Chemical Corporation. Chlorotrifluoroethylene telomerization process. 4,691,065, Cl. 570-139.000.

Dannoura, Sadayuki, to UBE Industries, Inc. Molten metal pouring device. 4,690,197, Cl. 164-312.000.

Dart Industries Inc.: *See*—
Ritchie, Robert C.; McKone, Henry J.; and Stamm, Richard H., 4,690,789, Cl. 264-40.100.

Das, Balbhadra: *See*—
Smoot, Michael A.; Barch, Herbert W.; and Das, Balbhadra, 4,690,760, Cl. 210-321.500.

Data General Corporation: *See*—
Erwin, Douglas A.; and Skinner, Robert L., 4,691,295, Cl. 364-900.000.

Dauchier, Jean-Michel: *See*—
Brezillon, Jean-Loup; and Dauchier, Jean-Michel, 4,689,880, Cl. 29-623.500.

Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., to Penlon Limited. Gas analysis apparatus and method. 4,690,562, Cl. 356-361.000.

Davis, Ronald I.; Phalangas, Charalambos J.; and Titus, George R., to ICI Americas Inc. Quaternary nitrogen containing polyvinyl alcohol polymers for use in skin conditioning, cosmetic and pharmaceutical formulations. 4,690,817, Cl. 424-70.000.

Dayco Products, Inc.: *See*—
Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Hollaway, Gerald C., Jr.; and Nelson, Jack, 4,690,665, Cl. 474-245.000.
Wetzel, Robert E., 4,690,664, Cl. 474-205.000.

Debevec, Anthony F. Fuel/oil pump. 4,690,108, Cl. 123-73.0AD.

DeBruyn, Frank E., Jr.; and Weed, Lucretia J., to Polaroid Corporation. Photographic element and method for forming transparencies. 4,690,884, Cl. 430-206.000.

Deck, Brent D. Contaminated fluid heat exchanging. 4,690,208, Cl. 165-119.000.

Decker, Raymond F.: *See*—
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,690,894, Cl. 435-244.000.

Decker, Robert W., to Ingersoll-Rand Company. Liquid intensifier unit. 4,690,622, Cl. 417-342.000.

Deckman, Harry W.: *See*—
Roxlo, Charles B.; and Deckman, Harry W., 4,690,750, Cl. 208-310.00Z.

Deckner, George E., to Charles of the Ritz Group Ltd. Method for testing skin for presence of moisturizer. 4,690,815, Cl. 424-9.000.

Declerck, Fredy: *See*—
Collart, Andre ; and Declerck, Fredy, 4,691,000, Cl. 528-244.000.

Deere & Company: *See*—
Landphair, Donald K., 4,690,260, Cl. 192-71.000.

DeFazio, Salvatore C.: *See*—
Hacknauer, Frank; DeFazio, Salvatore C.; and Fox, Richard S., 4,690,096, Cl. 118-657.000.

Degussa Aktiengesellschaft: *See*—
Andrade, Juan; Prescher, Gunter; and Kohler, Klaus, 4,691,062, Cl. 568-495.000.

Degussa Electronics Inc., Materials Division: *See*—
Hunt, Charles d'A., deceased, 4,690,875, Cl. 428-577.000.

Dehan, Louis: *See*—
Ouhadi, Trazoliah; and Dehan, Louis, 4,690,771, Cl. 252-102.000.

Dehennau, Claude; and Dubois, Paul, to Solvay & Cie. (Societe Anonyme). Adjustable feed block for coextrusion die. 4,690,628, Cl. 425-133.500.

Dejima, Fusao: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.

Dekkers, Nicolaas H.: *See*—
Le Poole, Jan B.; and Dekkers, Nicolaas H., 4,691,103, Cl. 250-311.000.

Deland, Olivier. Internal combustion engine. 4,690,113, Cl. 123-197.0AC.

DeLaney, George E., to Craft House Corporation. Toy vehicle carrying case and launcher. 4,690,654, Cl. 446-28.000.

DeLaski, Donald: *See*—
McCoy, Bing, 4,690,026, Cl. 84-1.190.

Delfourne, Paul, to R.A.T.P. Regie Autonome des Transports Parisiens. Inter-carriage passage for a railway train. 4,690,068, Cl. 105-8.100.

Delius, Doris: *See*—
Delius, Siegried; and Delius, Doris, 4,690,601, Cl. 414-96.000.

Delius, Siegried; and Delius, Doris. Storage assembly and method of using same. 4,690,601, Cl. 414-96.000.

Delta Wood Products, Inc.: *See*—
Bakr, Mamdouh M.; and Maloney, Bobby J., 4,690,466, Cl. 312-29.000.

Demarest, Scott W.: *See*—
Crapser, James R.; and Demarest, Scott W., 4,690,312, Cl. 222-402.170.

Demarne, Henri; Filhol, Robert; and Mosse, Madeleine, to Sanofi. Benzoic acid derivatives process for preparation and application as drugs, disinfectants or preservatives. 4,691,043, Cl. 560-064.000.

DeMars, Robert A. Compact radio. 4,691,383, Cl. 455-351.000.

Demeuldre, Daniel: *See*—
Callut, Francois; and Demeuldre, Daniel, 4,690,914, Cl. 502-400.000.

Denier, Guy; and Henrion, Romain, to Institute de Recherches de la Siderurgie Francaise. Method of improving the service life of permeable refractory elements in bottoms of metallurgical vessels. 4,690,386, Cl. 266-44.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Tanji, Hiroaki; Suzuki, Masaharu; Nomura, Kenji; Watanabe, Shojiro; and Kawasaki, Takashi, 4,690,841, Cl. 428-35.000.

Denne, Phillip R. M.; and Hook, Christopher D. Identification systems. 4,691,202, Cl. 340-825.540.

Dent, Larry G. Pipe cutting device. 4,689,883, Cl. 30-94.000.

Deprima, Anthony E.: *See*—
Lewis, Johnnie D., Jr., 4,689,902, Cl. 36-131.000.

Derby, Norwin C., to Super Sack Manufacturing Corporation. Receptacle having improved discharge spout. 4,691,371, Cl. 383-62.000.

De Regel, Alain: *See*—
Lacoste, Olivier H. V.; De Regel, Alain; Fujiwara, Hidenori; and Yap, Raymond C. C., 4,690,958, Cl. 523-172.000.

Deriso, John: *See*—
Blum, Stephen C.; and Deriso, John, 4,691,179, Cl. 333-202.000.

de Rooy, Nicolaas F.: *See*—
v.d. Vlekkert, Hendrik H.; and de Rooy, Nicolaas F., 4,691,167, Cl. 324-438.000.

Desarmot, Georges; and Sanchez, Manuel, to Office National d'Etudes et de Recherche Aerospatiales. Method of electrochemically surface treating carbon fibers, fibers treated by the method, and composite materials including such fibers. 4,690,738, Cl. 204-130.000.

DeShong, George T.: *See*—
Doutrich, Ray C.; and DeShong, George T., 4,690,477, Cl. 439-595.000.

DeSoto, Inc.: *See*—
Zimmerman, John M.; Noren, Gerry K.; and Bishop, Timothy E., 4,690,501, Cl. 350-96.290.
Zimmerman, John M.; and Bishop, Timothy E., 4,690,502, Cl. 350-96.290.

Detsch, Richard M.: *See*—
Carson, Paul L.; and Detsch, Richard M., 4,689,986, Cl. 73-19.000.

Deutsche Gesellschaft fur Wideraufarbeitung von Kernbrennstoffen mbH: *See*—
Heimerl, Wilfried; and Ewest, Eckhart, 4,690,781, Cl. 252-633.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See*—
Schepers, Erwin, 4,690,298, Cl. 220-325.000.

Deutsche ITT Industries GmbH: *See*—
Freyberger, Laurin C., 4,691,226, Cl. 358-26.000.

DeVigili, Walter J. Ski braking device. 4,690,423, Cl. 280-605.000.

Devro, Inc.: *See*—
Wakefield, Barry R.; and Pullen, Francis J., 4,689,854, Cl. 17-1.00R.

DeWitt, Susanne K.: *See*—
Loor, Rueyming; M'Timkulu, Thabiso; and DeWitt, Susanne K., 4,690,890, Cl. 435-7.000.

Diamond, Betty A., to Albert Einstein College of Medicine of Yeshiva University, a division of Yeshiva University. Method for removal of human antibodies to native DNA from serum. 4,690,905, Cl. 436-508.000.

DiBiase, Stephen A.; and Vinci, James N., to Lubrizol Corporation, The. Hydrogen sulfide stabilized oil-soluble sulfurized organic compositions. 4,690,767, Cl. 252-47.000.

Dickie, Laurence G., to B & W Loudspeakers Limited. Loudspeaker enclosures. 4,690,244, Cl. 181-146.000.

Dickson, Charles R.; and Carlson, David E., to Solarex Corporation. Activation by dehydrogenation or dehalogenation of deposition feedstock and dopant materials useful in the fabrication of hydrogenated amorphous silicon alloys for photovoltaic devices and other semiconductor devices. 4,690,830, Cl. 427-38.000.

Diebold, Incorporated: *See*—
Shoop, James D., 4,690,073, Cl. 109-59.00T.

Diehl GmbH & Co.: *See*—
Bugiel, Horst G., 4,690,062, Cl. 102-476.000.
Stessen, Lothar, 4,689,845, Cl. 60-228.000.

Dienes, Zoltan B., to Thomas & Betts Corporation. Venting apparatus for electrical cable. 4,691,083, Cl. 174-135.000.

Diesel Kiki Co., Ltd.: *See*—
Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, 4,690,619, Cl. 417-269.000.

Diesel Kiki Kabushiki Kaisha: *See*—
Iida, Katsumi, 4,690,203, Cl. 165-25.000.

Dietrich, Albert, to Dornier GmbH. Generating gas pressure in an expansion chamber. 4,690,060, Cl. 102-352.000.

Dietrich, Herbert, to Pfaff Industriemaschinen GmbH. Skin holder in an apparatus for letting out skins. 4,689,974, Cl. 69-27.000.

Digital Equipment Corporation: *See*—
Shell, Stanley, 4,691,199, Cl. 340-710.000.

Dijkstra, Arend; Haijkens, Bernardus; and Veenstra, Mient, to U.S. Philips Corporation. Electric machine with improved coil connection. 4,691,134, Cl. 310-234.000.

Diller, Calvin D.: *See*—
Nelson, Theodore G.; and Diller, Calvin D., 4,691,174, Cl. 330-260.000.

Dimitrov, Dimieter A.: *See*—
Garlanov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.

Dingwall, Andrew G. F.; and Zazzu, Victor, to RCA Corporation. Comparator with cascaded latches. 4,691,189, Cl. 340-347.0AD.

Dinkel, Nancy A.; Goldstein, Bernard; and Ettenberg, Michael, to RCA Corporation. Semiconductor structure and devices. 4,691,320, Cl. 372-45.000.

Dittmer, Catherine A.: *See*—
Uken, William D.; Dubrow, Robert S.; Nelson, Carib; and Dittmer, Catherine A., 4,690,831, Cl. 427-44.000.

Dixon, Dale D.: *See*—
Pinschmidt, Robert K., Jr.; Dixon, Dale D.; and Burgoyne, William F., Jr., 4,691,026, Cl. 548-531.000.

DNAX Research Institute of Molecular and Cellular Biology, Inc.: *See*—
Mosmann, Tim R., 4,690,893, Cl. 435-240.270.

Dobbs, Daniel R., to Sundstrand Corporation. Propulsion system for a torpedo with thrust compensation. 4,690,085, Cl. 114-20.200.

Dobbs, Robert J.; and Alexander, Shuford M., Jr., to GTE Products Corporation. High purity silicon nitride polishing compound. 4,690,693, Cl. 51-307.000.

Dobschal, Hans-Jurgen: *See*—
Florek, Stefan; Becker-Ross, Helmut; Dobschal, Hans-Jurgen; and Mohr, Joachim, 4,690,559, Cl. 356-328.000.

Dobutsu, Masakatsu: *See*—
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yuusuke; and Joshita, Yutaka, 4,690,949, Cl. 514-561.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Eger, Georg; and Srock, Rainer, 4,689,849, Cl. 16-82.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Bantle, Manfred; and Lechner, Reinhard, 4,690,462, Cl. 301-9.0CN.
Reichel, Anton; Lohmann, Bernard; Kolb, Eugen; Hochkonig, Manfred; Burst, Hermann; and Kretschmer, Helmut, 4,690,204, Cl. 165-44.000.
von Sivers, Rolf; Havemann, Kim; and Ilsemann, Bernhard, 4,690,238, Cl. 180-248.000.

Dr. Ing. Rudolf Hell GmbH: *See*—
Colditz, Armin; and Klopsch, Siegfried, 4,691,229, Cl. 358-76.000.

Doering, Charles W., to Brinly-Hardy Co., Inc. Pulled dethatching unit. 4,689,941, Cl. 56-396.000.

Dohmen, Petrus J. M., to U.S. Philips Corporation. Electric lamp and glass composition. 4,691,142, Cl. 313-623.000.

Dolinar, Brian J.: *See*—
King, Christopher N.; Dolinar, Brian J.; Barrow, William A.; Flegal, Robert T.; Gulick, Paul E.; and Blacken, Laurin G., 4,691,144, Cl. 315-169.300.

Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., to Schering Corporation. Process for preparing a specific diastereomer of a monoamino dicarboxylic acid ester. 4,691,049, Cl. 562-553.000.

Dolorgiet Beteiligungs-GmbH: *See*—
Lohner, Manfred; and Posselt, Klaus, 4,690,823, Cl. 424-456.000.

Domeier, Linda A.; and Gardner, Hugh C., to Amoco Corporation. Bismaleimides and prepreg resins therefrom. 4,691,025, Cl. 548-521.000.

Domke, Klaus, to Robert Bosch GmbH. Method for producing a packaging container having a pressure relief valve. 4,690,667, Cl. 493-213.000.

Domoto, Gerald A.: *See*—
Solcz, Edward J.; Domoto, Gerald A.; and Wolf, Barry M., 4,691,212, Cl. 346-108.000.

Donn Incorporated: *See*—
Mieyal, David F., 4,689,870, Cl. 29-469.500.

Donson, William A.; Ellerson, James V.; Hammer, Richard B.; Lafer, William; and Snyder, Keith A., to International Business Machines Corporation. Providing circuit lines on a substrate. 4,690,833, Cl. 427-96.000.

Dorer, Casper J., Jr.: *See*—
Johnston, Thomas E.; and Dorer, Casper J., Jr., 4,690,687, Cl. 44-67.000.

Dorfender Products Inc.: *See*—
Warren, Monty, 4,690,446, Cl. 293-128.000.

Dornier GmbH: *See*—
Dietrich, Albert, 4,690,060, Cl. 102-352.000.

Dornseif, E. Ronald: *See*—
McInerney, Edward J.; Dornseif, E. Ronald; and Zetterquist, Norman E., 4,690,746, Cl. 204-192.320.

Doroszkowski, Andrew; and Skinner, Maurice W., to Imperial Chemical Industries PLC. Process of coating a heated surface. 4,690,837, Cl. 427-314.000.

Doshi, Kishore J., to Union Carbide Corporation. Enhanced gas separation process. 4,690,695, Cl. 55-16.000.

Douglas-Hamilton, Margaret M., to 501 Hamilton/Thorn Research Associates. Device and method for facilitating animal artificial insemination. 4,690,678, Cl. 604-349.000.

Douglas, Monte A., to Texas Instruments Incorporated. Tapered trench process. 4,690,729, Cl. 156-643.000.

Dousteyssier, Jacques: *See*—
Corvazier, Philippe; and Dousteyssier, Jacques, 4,691,113, Cl. 250-577.000.

Doutrich, Ray C.; and DeShong, George T., to Du Pont de Nemours, E. I., and Company. Electrical connector apparatus. 4,690,477, Cl. 439-595.000.

Dow Chemical Company, The: *See*—
Beaver, Richard N.; Morris, Gregory J.; Pimlott, John R.; and Dang, Hiep D., 4,690,748, Cl. 204-279.000.
Cringle, David C.; Pearce, Roscoe L.; and DuPart, Michael S., 4,690,740, Cl. 204-147.000.
Hahnfeld, Jerry L., 4,690,976, Cl. 525-70.000.
Hoffman, Dwight K.; Stevens, Michael G.; and Messick, Virginia B., 4,690,988, Cl. 525-502.000.
Keskey, William H.; and Johnson, Mark R., 4,690,995, Cl. 526-286.000.
Lane, George A.; and Rossow, Harold E., 4,690,769, Cl. 252-70.000.
Mendoza, Abel; and Otterbacher, Eric W., 4,691,042, Cl. 560-61.000.
Tomalia, Donald A.; and Hall, Mark J., 4,690,985, Cl. 525-419.000.
Wampfler, David J.; Fielding, Donna J.; and Pawloski, Chester E., 4,690,954, Cl. 521-107.000.
Wang, Pen C.; Stuart, Van I. W.; Yates, Ronald L.; and Crain, Steven P., 4,691,021, Cl. 548-309.000.

Dow Corning Corporation: *See*—
Plueddemann, Edwin P., 4,690,959, Cl. 523-213.000.

Dow Corning, Ltd.: *See*—
Adams, Graham; and Jones, Martin A., 4,690,688, Cl. 44-76.000.

Dowbenko, Rostyslaw: *See*—
Singer, Debra L.; Birkmeyer, William J.; Dowbenko, Rostyslaw; and Kania, Charles M., 4,690,980, Cl. 525-286.000.

Dowding, John G.: *See*—
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., 4,690,604, Cl. 414-403.000.

Downes, James E.: *See*—
Nathan, Vaidy R.; Wang, John T.; and Downes, James E., 4,690,809, Cl. 423-306.000.

Doy, Ralph J.: *See*—
Andrew, Sydney P.; Doy, Ralph J.; and Limbach, Antony P. J., 4,690,690, Cl. 48-214.00A.

Doyle, Brian M.: *See*—
Banas, Conrad M.; and Doyle, Brian M., 4,691,093, Cl. 219-121.0LC.

Doyle, Terrence W.: *See*—
Vyas, Dolatrai M.; Chiang, Yulin; and Doyle, Terrence W., 4,691,023, Cl. 548-422.000.

Draft, Howard J.; and Chambers, Robert W. Face guard design. 4,689,835, Cl. 2-424.000.

Draper, Reed T.; Pol, Kenneth J.; and Martin, Dennis R., to Draper Technologies, Inc. Coupon packet dispensing system. 4,690,303, Cl. 221-131.000.

Draper Technologies, Inc.: *See*—
Draper, Reed T.; Pol, Kenneth J.; and Martin, Dennis R., 4,690,303, Cl. 221-131.000.

Drent, Eit, to Shell Oil Company. Preparation of carboxylic di-esters or acids. 4,691,047, Cl. 560-204.000.

Dresser Industries, Inc.: *See*—
Huffman, Joseph L., 4,690,573, Cl. 384-251.000.

Drobe, Wolfgang: *See*—
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschick, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.

Drommert, Heinz: *See*—
Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, 4,691,110, Cl. 250-458.100.

Droulon, Georges: *See*—
Pipon, Yves; and Droulon, Georges, 4,690,458, Cl. 297-379.000.

Drummond, Robert L. Side bar wafer lock, an improved spring retainer for said lock, and a method of using said spring retainer in said lock. 4,689,978, Cl. 70-431.000.

Dubois, Paul: *See*—
Dehennau, Claude; and Dubois, Paul, 4,690,628, Cl. 425-133.500.

Dubrow, Robert S.: *See*—
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Harrison, Reginald, 4,690,388, Cl. 267-35.000.

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Christensen, Joel R., 4,690,705, Cl. 71-90.000.
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Fong, Dan S., 4,690,865, Cl. 428-341.000.
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Sze, Benjamin C., 4,691,003, Cl. 528-308.100.
Williams, John F.; and Wagner, Emery L., 4,690,669, Cl. 494-14.000.
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Brede, Uwe; and Kordel, Gerhard, 4,690,056, Cl. 102-202.200.

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Rice, Camilla A., 4,690,868, Cl. 428-409.000.

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Knauss, Hermann, 4,691,096, Cl. 219-441.000.

E. L. LeBaron Foundry Co.: *See*—
LeBaron, Francis, 4,690,584, Cl. 404-26.000.

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Wolniak, Stanley C.; and Laabs, Timothy P., 4,689,977, Cl. 70-379.00R.

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Voelz, Dieter; and Illerhaus, Roland, 4,690,228, Cl. 175-24.000.

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Acello, John J., 4,691,249, Cl. 358-336.000.
Brownstein, Scott A., 4,691,211, Cl. 346-76.0PH.
Calver, John G.; Pearce, Phillip W.; and Zielinski, Erich, 4,691,265, Cl. 361-386.000.
Hacknauer, Frank; DeFazio, Salvatore C.; and Fox, Richard S., 4,690,096, Cl. 118-657.000.
Hansen, David E.; Kelbe, Richard R.; and Wolcott, Dana W., 4,690,531, Cl. 354-149.110.
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Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,691,050, Cl. 562-406.000.

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Bopp, Warren G.; and Janson, David A., 4,690,256, Cl. 192-21.000.
Damiano, Michael A.; and Schmerda, Richard F., 4,691,197, Cl. 340-638.000.
Egle, Lawrence E., 4,690,120, Cl. 123-571.000.

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Eberhardt, H. Alfred, to Hale Fire Pump Company. Portable engine-pump assembly. 4,690,613, Cl. 415-148.000.

ECB Technologies, Inc.: *See*—
Kuzyk, Roman; Bender, Richard H.; and Edwards, Lew, 4,690,546, Cl. 355-69.000.

Echizen, Susumu: *See*—
Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, 4,690,619, Cl. 417-269.000.

Ecklund, Lawrence M., to Motorola, Inc. Adaptive phase locked loop having a variable locking rate. 4,691,175, Cl. 331-1.00A.

Ecolab Inc.: *See*—
Copeland, James L., 4,690,305, Cl. 222-52.000.

Economy, James: *See*—
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,690,962, Cl. 524-94.000.

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Nussbaumer, Manfred; Glaser, Eberhard; and Beitinger, Eberhard, 4,690,590, Cl. 405-267.000.

Edakubo, Hiroo: *See*—
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,691,256, Cl. 360-73.000.

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Edmonds, Michael G.: *See*—
Betts, David R.; and Edmonds, Michael G., 4,690,417, Cl. 280-42.000.

Edwards, Brian E.; and Biron, David G., to Massachusetts Institute of Technology. Laser radar utilizing pulse-tone waveform. 4,690,551, Cl. 356-5.000.

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McCarthy, Brian D.; and Edwards, Michael, 4,689,834, Cl. 2-422.000.

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Matsui, Tohru; and Egawa, Takeshi, 4,690,538, Cl. 354-403.000.

Eger, Georg; and Srock, Rainer, to Dr. Ing. h.c.F. Porsche AG. Control mechanism for a door of a motor vehicle with a reciprocating safety valve. 4,689,849, Cl. 16-82.000.

Egle, Lawrence E., to Eaton Corporation. Exhaust gas recirculation control system. 4,690,120, Cl. 123-571.000.

Eguchi, Yasukata; Hara, Kazumasa; and Hisatake, Michio, to Janome Sewing Machine Co Ltd. Device for regulating upper thread tension of a sewing machine. 4,690,082, Cl. 112-254.000.

Eickmann, Karl. Variable radial piston pump. 4,690,620, Cl. 417-273.000.

Eickmann, Karl. Fluid pumps, fluid motors and devices, which include a coned ring. 4,690,623, Cl. 417-472.000.

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Takada, Susumu; Sasatani, Takashi; Shindo, Hirohisa; Matsushita, Akira; and Eigyo, Masami, 4,690,930, Cl. 514-293.000.

Eilertson, Donald M. Self-propelled stump cutter. 4,690,183, Cl. 144-2.00N.

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Rydefalk, Staffan; and Einarsson, Jens, 4,689,988, Cl. 73-61.00R.

Einsle, Guenter; Mayr, Ernst; Oestreich, Ulrich; Schoeber, Gernot; and Schrey, Wolfgang, to Siemens Aktiengesellschaft. Pay-out stand for supply reels. 4,689,943, Cl. 57-90.000.

Einzinger, Josef; Fellinger, Christine; Leipold, Ludwig; Tihanyi, Jenoe; and Weber, Roland, to Siemens Aktiengesellschaft. Drive circuit for a power MOSFET with source-side load. 4,691,129, Cl. 307-581.000.

Eisenbraun, Allan A., to Ethyl Corporation. Process for making alkali metal aryloxides. 4,691,057, Cl. 564-223.000.

Eke, Kenneth I., to Microwave Ovens Limited. Microwave oven with power transfer automatically responsive to dielectric load of food. 4,691,088, Cl. 219-10.55F.

Elco, Richard A.; and Vandegriff, Hugh R., to Du Pont de Nemours, E. I., and Company. High density flex connector system. 4,690,472, Cl. 439-67.000.

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Huber, Thomas, 4,689,847, Cl. 16-26.000.

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Mongeau, Peter P., 4,691,133, Cl. 310-178.000.

Eli Lilly and Company: *See*—
Anderson, David B.; Schmiegel, Klaus K.; and Veenhuizen, Edward L., 4,690,951, Cl. 514-653.000.

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Robertsen, Anthony L., 4,690,566, Cl. 368-108.000.

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Barnett, Timothy J., 4,690,040, Cl. 98-2.140.

Ell, Travis E.; and Stephenson, Jeff, to International Business Machines Corporation. Data disk drive velocity estimator. 4,691,152, Cl. 318-616.000.

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Hughes, Brett A.; Gilbert, David L.; and Ellerbrock, Eugene A., 4,689,868, Cl. 29-523.000.

Ellerbroek, Brent L., to Hughes Aircraft Company. Solid-state wavefront slope determination. 4,690,555, Cl. 356-121.000.

Ellerson, James V.: *See*—
Donson, William A.; Ellerson, James V.; Hammer, Richard B.; Lafer, William; and Snyder, Keith A., 4,690,833, Cl. 427-96.000.

Elliott, Charles T.; and White, Anthony M., to Secretary of State for Defence, The. Infra red photo detector systems. 4,691,107, Cl. 250-370.000.

Elliott, Gregory K., to Kaiser Aerospace & Electronics Corporation. Open flow valve assembly. 4,690,296, Cl. 220-259.000.

Ellis, Donald G.: *See*—
Moulding, Thomas S., Jr.; and Ellis, Donald G., 4,690,676, Cl. 604-189.000.

El-Menshawy, El-Sayed: *See*—
Puchalski, Eugene, Jr.; Schneider, Emil F.; Cohee, Judith A.; and El-Menshawy, El-Sayed, 4,690,818, Cl. 424-70.000.

Elscint Ltd.: *See*—
Blass, Judd; and Keren, Hanan, 4,691,163, Cl. 324-318.000.
Fenster, Paul; and Shimoni, Yair, 4,691,366, Cl. 382-54.000.

Emhart Industries, Inc.: *See*—
Kulig, Constantine W., 4,690,703, Cl. 65-265.000.

Emler, Don R.; and Thomas, Glenn M. Flow enhancer for reed inlet valves. 4,690,107, Cl. 123-65.00V.

Emmel, Henry J.: *See*—
Clark, James A.; and Emmel, Henry J., 4,690,519, Cl. 350-515.000.

Emoto, Shigeo: *See*—
Yamauchi, Fumio; Tohara, Tsutomu; Nakano, Shigeo; and Emoto, Shigeo, 4,690,960, Cl. 523-442.000.

Endo, Mitsuhiro: *See*—
Ando, Hiromi; Endo, Mitsuhiro; and Ono, Yukou, 4,690,034, Cl. 91-369.00A.

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Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., 4,691,243, Cl. 358-294.000.
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Ritchie, Robert C.; McKone, Henry J.; and Stamm, Richard H., 4,690,789, Cl. 264-40.100.

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Heideman, Robert J., 4,690,255, Cl. 188-287.000.

Engel, Dusan J.; and Gilson, Jean-Pierre, to UOP Inc. Isomerization of cresols. 4,691,063, Cl. 568-783.000.

Engelke, Fritz: *See*—
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.

Engle, Elbert, to Chesebrough-Pond's, Inc. Apparatus for separating stacks of cloth. 4,690,393, Cl. 271-4.000.

Entenman, Alan W., to Radyne Corporation. Data transmission system with error correcting data encoding. 4,691,318, Cl. 371-43.000.

Envopak Group Limited: *See*—
Arthur, Frank H., 4,690,444, Cl. 292-324.000.

Epoch Company, Ltd.: *See*—
Ukisu, Hiroshi, 4,690,645, Cl. 434-309.000.

Erb, Robert A., to Daltex Medical Sciences, Inc. Urine collection system for females. 4,690,677, Cl. 604-329.000.

Erhardt, Manfred: *See*—
Loos, Herbert; and Erhardt, Manfred, 4,689,918, Cl. 51-105.0GG.

ERNO Raumfahrttechnik Gmbh: *See*—
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Erwin, Larry: *See*—
Cavanaugh, James E.; Erwin, Larry; and Hetherington, Robert D., 4,690,308, Cl. 222-156.000.

Esco Corporation: *See*—
Briscoe, Terry L., 4,689,904, Cl. 37-135.000.

ESGE-Marby GmbH & Co. KG: *See*—
Belka, Heinrich, 4,690,420, Cl. 280-289.00A.

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Fitzmorris, Tyce; Espenhahn, Eric; and Pereira, Jamie, 4,691,231, Cl. 358-106.000.

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Sherman, Charles F., 4,689,906, Cl. 40-152.100.

Etablissements Staubli Verdol: *See*—
Bassi, Dario; and Palau, Joseph, 4,690,178, Cl. 139-455.000.

Estlick, Raymond J.: *See*—
Grosso, Vincent A.; Estlick, Raymond J.; and Zarr, William A., 4,690,350, Cl. 244-3.100.

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Dinkel, Nancy A.; Goldstein, Bernard; and Ettenberg, Michael, 4,691,320, Cl. 372-45.000.

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Evans, Samuel, to Ciba-Geigy Corporation. Antioxidants for organic materials. 4,691,044, Cl. 560-75.000.

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Eveready Battery Company: *See*—
Huhndorff, Harry R.; and Myers, John P., 4,690,879, Cl. 429-61.000.

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Everman, Wayne H.; and Gilbert, Joseph H., to Combs Enterprises, Inc. Apparatus for shale oil retorting. 4,690,732, Cl. 202-100.000.

Ewest, Eckhart: *See*—
Heimeri, Wilfried; and Ewest, Eckhart, 4,690,781, Cl. 252-633.000.

Exibelco GmbH: *See*—
Maier, Helmut; Neumann, Bruno; and Schaafhausen, Ludwig R., 4,690,582, Cl. 403-252.000.

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Lacoste, Olivier H. V.; De Regel, Alain; Fujiwara, Hidenori; and Yap, Raymond C. C., 4,690,958, Cl. 523-172.000.
Michaelson, Robert C., 4,691,073, Cl. 585-639.000.

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Hou, Ching-Tsang; and Barnabe, Nancy P., 4,690,891, Cl. 435-42.000.
Jenkinson, Ronald J., 4,690,802, Cl. 422-141.000.
Roxlo, Charles B.; and Deckman, Harry W., 4,690,750, Cl. 208-310.00Z.
Schorffheide, James J., 4,690,806, Cl. 423-230.000.

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Fadner, Thomas A.; Harenza, Edward R.; Hycner, Stanley H.; and Robinson, Nelson M., to Rockwell International Corporation. Keyless inking system for offset lithographic printing press. 4,690,055, Cl. 101-451.000.

Fahey, Brian W. Running shoe. 4,689,898, Cl. 36-43.000.

Falcetta, Joseph J.; and Park, Joonsup, to Alcon Laboratories, Inc. p-(2-Hydroxy hexafluoroisopropyl) styrene [HFIS] monomer for ophthalmic applications. 4,690,993, Cl. 526-242.000.

Falk, Jerry: *See*—
Bergina, Lewis A.; Amundson, Anthony P.; and Falk, Jerry, 4,691,314, Cl. 370-94.000.

Fall, James C. Head and magazine loader assembly. 4,689,881, Cl. 29-813.000.

Fanuc Ltd.: *See*—
Nakano, Jiro, 4,691,131, Cl. 310-54.000.

Farmer, James O., to Scientific Atlanta, Inc. Scrambling systems for CATV. 4,691,353, Cl. 380-15.000.

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Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; and Salvati, Patricia, 4,690,929, Cl. 514-288.000.

Farrell, Roberta L., to Repligen Corporation. Use of rLDM TM 1-6 and other ligninolytic enzymes in the bleaching of kraft pulp. 4,690,895, Cl. 435-278.000.

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Gauthier, Michel; and Fauteux, Denis, 4,690,840, Cl. 427-436.000.

Fauth, Karl-Heinz: *See*—
Schick, Hans; Kolk, Erich; Fauth, Karl-Heinz; and Mohr, Heinrich, 4,691,072, Cl. 585-525.000.

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Brandli, Max; and Feldmann, Hansueli, 4,690,422, Cl. 280-460.00R.

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Horenkamp, Franz, 4,690,358, Cl. 248-297.300.

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Off, Joseph W. A.; and Ferguson, Vivian, 4,690,078, Cl. 112-121.120.

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Buhrer, Carl F.; and Feuersanger, Alfred E., 4,691,141, Cl. 313-565.000.

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Gob, Werner; and Anders, Peter, 4,690,103, Cl. 123-41.120.

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Wampfler, David J.; Fielding, Donna J.; and Pawloski, Chester E., 4,690,954, Cl. 521-107.000.

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Lyddy, James E.; and Fincke, Randall W., 4,690,162, Cl. 137-1.000.

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Kuker, Wolfgang; and Findeklee, Heinz, 4,690,067, Cl. 105-3.000.

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Fischer, Adolf, deceased, 4,690,706, Cl. 71-91.000.

Fischer, Edgar E. Method of maintaining an uninterrupted warning signal. 4,690,059, Cl. 102-336.000.

Fischer, William C.: *See*—
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King, Christopher N.; Dolinar, Brian J.; Barrow, William A.; Flegal, Robert T.; Gulick, Paul E.; and Blacken, Laurin G., 4,691,144, Cl. 315-169.300.

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Flesher, Peter; Clarke, John; and Marshall, David, to Allied Colloids Limited. Water absorbing polymers. 4,690,971, Cl. 524-555.000.

Flexwatt Corporation: *See*—
Grise, Frederick G. J., 4,690,347, Cl. 242-57.100.

Flight, Robert S., to Caldwell Manufacturing Company. Pulley mount for window balance system. 4,689,850, Cl. 16-197.000.

Flood, Gary N., to Branson Ultrasonics Corporation. Ultrasonic apparatus for joining and severing sheet material. 4,690,722, Cl. 156-510.000.

Florek, Stefan; Becker-Ross, Helmut; Dobschal, Hans-Jurgen; and Mohr, Joachim, to Jenoptik Jena GmbH. Optical system for spectral analysis devices. 4,690,559, Cl. 356-328.000.

Fluegge, Jerry H., to Ford Motor Company. Double isolated jounce bumper system. 4,690,428, Cl. 280-697.000.

Foglesonger, John D.; and Vranson, David M., to ITT Gilfillan, a division of ITT Corporation. Method of making waveguide assembly. 4,689,876, Cl. 29-600.000.

Fong, Dan S., to Du Pont de Nemours, E. I., and Company. Heat-shrinkable polymeric barrier film. 4,690,865, Cl. 428-341.000.

Forbes, Richard L., II; and Thorp, Bruce E., to Xerox Corporation. Blade cleaning apparatus for flexible belt. 4,690,544, Cl. 355-15.000.

Ford Aerospace & Communications Corporation: *See*—
Conboy, Leo W., 4,691,293, Cl. 364-724.000.

Ford Motor Company: *See*—
Fluegge, Jerry H., 4,690,428, Cl. 280-697.000.

Forner, Siegfried: *See*—
Weber, Robert; Bieselt, Roland; Forner, Siegfried; and Mechtold, Helmut, 4,689,863, Cl. 29-33.00T.

Forsyth, Robert P., to Polaroid Corporation. Composite lens assembly. 4,690,512, Cl. 350-417.000.

Forte, Paulino; and Vidueira, Jose A., to Union Carbide Corporation. Process for the separation of hydrocarbons from a mixed feedstock. 4,690,733, Cl. 203-21.000.

Fory, Werner; Gass, Karl; and Meyer, Willy, to Ciba-Geigy Corporation. Sulfonylureas. 4,690,707, Cl. 71-93.000.

Foseco International Limited: *See*—
Vernay, Pierre, 4,690,196, Cl. 164-58.100.

Fotheringham, James R., to Caterpillar Industrial Inc. Lift mast transport arrangement. 4,690,610, Cl. 414-631.000.

Fowler, Daniel L., to Robertshaw Controls Company. Method of making a membrane keyboard. 4,689,879, Cl. 29-622.000.

Fox, Richard S.: *See*—
Hacknauer, Frank; DeFazio, Salvatore C.; and Fox, Richard S., 4,690,096, Cl. 118-657.000.

Francis, Martin: *See*—
Dutton, Hugh J.; and Francis, Martin, 4,689,928, Cl. 52-235.000.

Fredericks, Walter A.; and McCullough, Edward W., to Rexnord Inc. Torsional stress distribution flexible coupling. 4,690,661, Cl. 464-78.000.

Freitag, Dieter: *See*—
Wahle, Bernd; Freitag, Dieter; Uerdingen, Walter; Heine, Heinrich; and Blazejak, Manfred, 4,690,998, Cl. 528-96.000.

Freyberger, Laurin C., to Deutsche ITT Industries GmbH. Color-television receiver with at least one integrated circuit for processing the digitized composite color signal. 4,691,226, Cl. 358-26.000.

Frick Company: *See*—
Mandy, Zoltan A., 4,690,759, Cl. 210-304.000.

Frick, Willy; Meyer, Alfred; and Nyfeler, Robert, to CIBA-GEIGY Corporation. 1-aryl-2-fluoro-2-azolyl alkanones, alkanols, esters, and ethers, composition containing them, and use of them to control phytopathogenic microorganisms. 4,690,942, Cl. 514-383.000.

Fried, John H.; and Venuti, Michael C., to Syntex (U.S.A.) Inc. (2-Oxo-1,2,3,5-tetrahydroimidazo-[2,1-B]quinazolinyl) oxyalkylamides properties having phosphodiosterase inhibiting. 4,690,925, Cl. 514-267.000.

Friedberger, Otmar: *See*—
Kuntze-Fechner, Gerald; Friedberger, Otmar; and Hahn, Michael, 4,690,615, Cl. 416-134.00A.

Friedman, Alexander A.; and Podolak, Peter L., to Syracuse University. Anaerobic contactor. 4,690,755, Cl. 210-96.100.

Friedman, Walter; and Stricker, David J., to Kenner Parker Toys, Inc. Wheel and winch assemblies utilizing identical hubs and axles in a toy construction set. 4,690,656, Cl. 446-95.000.

Frisch, Eberhard, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Geostationary communications satellite. 4,690,354, Cl. 244-158.00R.

Fritz, Otmar, to Siemens Aktiengesellschaft. Carrier member for integrated modules. 4,690,275, Cl. 206-331.000.

Froelich, Ronald W. Fingerprint identification device. 4,690,554, Cl. 356-71.000.

Frolow, Jack L. Tennis racket. 4,690,405, Cl. 273-73.00C.

Frost, Jonathan: *See*—
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, 4,690,931, Cl. 514-317.000.

Fruhauf, Waldemar, to Siemens Aktiengesellschaft. Circuit for coupling a signal processing device to a transmission line. 4,691,128, Cl. 307-557.000.

Fuji Electric Co., Ltd.: *See*—
Kato, Toshiaki, 4,691,242, Cl. 358-294.000.
Nishiura, Masaharu, 4,689,874, Cl. 437-2.000.
Yokomori, Shinji, 4,690,263, Cl. 194-317.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Sakai, Yasuhito; and Yamada, Kenichi, 4,690,011, Cl. 74-475.000.

Fuji Photo Film Co., Ltd.: *See*—
Kamiyama, Kouzi, 4,690,768, Cl. 252-62.580.
Kubodera, Seiiti; and Okazaki, Masaki, 4,690,883, Cl. 430-203.000.
Kubodera, Seiiti; and Okazaki, Masaki, 4,690,883, Cl. 430-203.000.
Miyoshi, Takahito; Fujiyama, Masaaki; Matsufuji, Akihiro; and Yamamoto, Nobuyuki, 4,690,863, Cl. 428-328.000.
Naritomi, Yasuhisa; Takahashi, Hiroshi; and Shiba, Keisuke, 4,690,886, Cl. 430-303.000.
Okada, Kazuo; and Nakayama, Yoshiaki, 4,691,252, Cl. 360-75.000.
Okita, Tsutomu; Tsuji, Nobuo; Hashimoto, Hiroshi; and Mukaida, Yoshito, 4,690,870, Cl. 428-425.900.
Saito, Naoki; Aoki, Kozo; and Yokota, Yukio, 4,690,889, Cl. 430-552.000.
Shirahata, Ryuji; and Tamai, Yasuo, 4,690,857, Cl. 428-216.000.
Yagihara, Morio; and Ikegawa, Akihiko, 4,690,885, Cl. 430-212.000.

Fujie, Daijiro, to Nippon Kogaku K. K. Retrofocus type wide angle lens. 4,690,517, Cl. 350-458.000.

Fujii, Masahiko: *See*—
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.

Fujii, Mitsuo: *See*—
Suzuki, Soichi; Aihara, Mitsuo; and Fujii, Mitsuo, 4,691,287, Cl. 364-490.000.

Fujii, Takayoshi: *See*—
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.

Fujii, Toshifumi: *See*—
Ookawa, Katsuhiro; Fujii, Toshifumi; and Nishida, Yoshihiro, 4,691,251, Cl. 360-14.100.

Fujimoto, Hiroaki: *See*—
Ogasahara, Takio; and Fujimoto, Hiroaki, 4,690,109, Cl. 123-73.00A.

Fujino, Akihiko; Inoue, Manabu; Nakai, Masaaki; and Sekida, Minoru, to Minolta Camera Kabushiki Kaisha. Camera with release control and automatic film sensitivity setting. 4,690,530, Cl. 354-21.000.

Fujino, Akihiko: *See*—
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, 4,690,536, Cl. 354-402.000.

Fujino, Kiyoharu, to Mitsubishi Monsanto Chemical Company. Process for preparation of alkenylsuccinic anhydrides. 4,691,030, Cl. 549-255.000.

Fujioka, Hirofumi; and Inoue, Masami, to Mitsubishi Denki Kabushiki Kaisha. Ultra-violet ray curing type resin composition. 4,690,957, Cl. 522-31.000.

Fujisaki, Koji: *See*—
Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, 4,690,999, Cl. 528-188.000.

Fujisawa, Naoki, to Toyota Jidosha Kabushiki Kaisha. Console box for automobile. 4,690,448, Cl. 296-37.800.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Hata, Takehisa; Kanagawa, Nobuto; Morishita, Takashi; and Suzuki, Toshiyuki, 4,690,816, Cl. 424-456.000.
Uemura, Toshinobu; Okhuma, Toshiaki; Shinooka, Kiyohide; Ishikuro, Hiroshi; and Ueda, Yoshio, 4,690,822, Cl. 424-455.000.

Fujitsu Limited: *See*—
Nagashima, Masayasu; and Iijima, Nobuo, 4,690,591, Cl. 406-88.000.
Satoh, Taizo, 4,691,145, Cl. 315-169.300.

Fujiwara, Hidenori: *See*—
Lacoste, Olivier H. V.; De Regel, Alain; Fujiwara, Hidenori; and Yap, Raymond C. C., 4,690,958, Cl. 523-172.000.

Fujiwhara, Mitsuto; Nimura, Takao; Numata, Yasumasa; and Matsubara, Yasuko, to Konishiroku Photo Industry Co., Ltd. Silver halide color photo-sensitive material. 4,690,888, Cl. 430-549.000.

Fujiyama, Masaaki: *See*—
Miyoshi, Takahito; Fujiyama, Masaaki; Matsufuji, Akihiro; and Yamamoto, Nobuyuki, 4,690,863, Cl. 428-328.000.

Fukahori, Kiyoshi; and Glad, Thomas, to Silicon Systems, Inc. MOS Switched capacitor automatic gain control circuit. 4,691,172, Cl. 330-129.000.

Fukamizu, Hiroshi; Nakano, Masaji; Iba, Kunio; Yamasaki, Taro; and Sano, Kenji, to Omron Tateisi Electronics Co. Road surface condition detection system. 4,690,553, Cl. 356-51.000.

Fukatsu, Kiyoshi: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.

Fukuchi, Shuzo; and Yamaguchi, Shigeru, to Nippon Shokubai Kagaku Co., Ltd. Hydroxyl group-containing (meth)acrylate oligomer, prepolymer therefrom, and method for use thereof. 4,691,045, Cl. 560-185.000.

Fukuda, Ken; and Ueba, Hisaaki, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Kureha Gosen Kabushiki Kaisha. Contact material for treating sewage of braided pile material. 4,690,849, Cl. 428-91.000.

Fukuda, Kimio: *See*—
Ito, Bunsaku; Fukuda, Kimio; and Hara, Rikio, 4,690,856, Cl. 428-215.000.

Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, to Hitachi, Ltd. Semiconductor memory. 4,691,298, Cl. 365-189.000.

Fukuda, Mitsutoshi; Fukutomi, Makoto; Kogure, Osamu; and Miyoshi, Kazunori, to Nippon Telegraph and Telephone Corporation; and Toyo Soda Manufacturing Co., Ltd. Method for forming micro-patterns by development. 4,690,887, Cl. 430-331.000.

Fukuda, Yutaro: *See*—
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,690,974, Cl. 525-64.000.
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,690,975, Cl. 525-64.000.

Fukuma, Nobuo; Hasegawa, Hisayasu; Murayama, Kimimasa; Hayashi, Kunio; and Tokudome, Yoshihiro, to Toyota Jidosha Kabushiki Kaisha. Method of making valve sleeves. 4,689,864, Cl. 29-157.10R.

Fukushima, Isao: *See*—
Miura, Kuniaki; Okada, Yoshinori; Fukushima, Isao; and Otsuka, Susumu, 4,691,246, Cl. 358-310.000.

Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, to Toyota Jidosha Kabushiki Kaisha. Apparatus and method for plasma treatment of resin material. 4,690,097, Cl. 118-723.000.

Fukutomi, Makoto: *See*—
Fukuda, Mitsutoshi; Fukutomi, Makoto; Kogure, Osamu; and Miyoshi, Kazunori, 4,690,887, Cl. 430-331.000.

Fukuyama, Munekatsu: *See*—
Imakoshi, Shigeyoshi; Fukuyama, Munekatsu; Suyama, Hideo; and Souda, Yutaka, 4,691,259, Cl. 360-113.000.

Fukuzawa, Takahiko; and Kitahara, Kiyoshi, to Citizen Watch Co., Ltd. Bit pattern conversion apparatus. 4,691,364, Cl. 382-41.000.

Fulterer Gesellschaft m.b.H.: *See*—
Fulterer, Manfred, 4,690,571, Cl. 384-22.000.

Fulterer, Manfred, to Fulterer Gesellschaft m.b.H. Pullout guide assembly for mounting sliding furniture parts. 4,690,571, Cl. 384-22.000.

Fuminao, Tanitomi, to Kaisei Kogyo Corporation. Tree pruning machine. 4,690,184, Cl. 144-2.00Z.

Funabashi, Katsunori; Nakashima, Tai; Yamada, Toshiyuki; and Morishima, Kazuo, to Honda Giken Kogayo Kabushiki Kaisha. Rear structure for motorcycles. 4,690,237, Cl. 180-219.000.

Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,690,864, Cl. 428-336.000.

Funahashi, Toshihiko: *See*—
Inokuti, Yukio; Ikeda, Shigeko; Funahashi, Toshihiko; and Ito, Yo, 4,690,855, Cl. 428-209.000.

Fung, Bill S. K.; and Hrutfiord, Bjorn F., to Monsanto Company. Oxidation of acetovantillone to vanillin. 4,691,061, Cl. 568-432.000.

Furst, Andor; Labler, Ludwig; and Meier, Werner, to Hoffmann-La Roche Inc. Process for the preparation of cholesterol derivatives and novel intermediates therefor. 4,691,032, Cl. 549-450.000.

Furuhata, Kimio: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.

Furui, Toshiyuki, to NEC Corporation. Data processing system simultaneously carrying out address translation of a plurality of logical addresses. 4,691,281, Cl. 364-200.000.

Furukawa, Yuusuke: *See*—
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yuusuke; and Joshita, Yutaka, 4,690,949, Cl. 514-561.000.

Furunushi, Yasuko: *See*—
Tsunoyama, Kouzou; Ohashi, Yoshiharu; Furunushi, Yasuko; and Konishi, Motoyuki, 4,690,558, Cl. 356-318.000.

Furuse, Masayasu: *See*—
Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, 4,690,973, Cl. 525-54.100.

Furusho, Takao: *See*—
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.

Furuta, Hideya; Koizumi, Yutaka; Mamizuka, Mitsuru; and Sakai, Yoshihiro, to Ricoh Company, Ltd. Color copying apparatus. 4,690,542, Cl. 355-4.000.

Furuta, Hideya: *See*—
Sakai, Yoshihiro; Ikeda, Itsuo; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, 4,690,541, Cl. 355-4.000.

Furuya, Tamio: *See*—
Otsuka, Nobuyuki; Kasuya, Atsuo; Nakayama, Yusho; Kumashiro, Masayuki; Furuya, Tamio; and Kaiho, Shigeo, 4,689,979, Cl. 72-57.000.

G & B Rubber Stamp Co., Inc.: *See*—
Munyon, Gary D.; and Swiech, Matthew J., 4,690,053, Cl. 101-328.000.

G-C Dental Industrial Corp.: *See*—
Kyotani, Ikuo, 4,690,642, Cl. 433-142.000.
Yoshida, Takaichi, 4,690,799, Cl. 420-507.000.

G. Dusterloh, GmbH: *See*—
Klie, Jurgen; and Beyer, Rudolf, 4,690,038, Cl. 92-181.00R.

Gabano, Jean-Paul; Broussely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, to Saft, S.A. Electrochemical cell having a non-aqueous electrolyte. 4,690,877, Cl. 429-194.000.

Gabarro, Jose A. P.: *See*—
Arechaga, Sabastian J.; Granell, Jose O. O.; Linan, Carmen S.; Vallejo, Alfonso P.; and Gabarro, Jose A. P., 4,690,945, Cl. 514-448.000.

Gabriele, Joseph M.; Sam, George J., Sr.; Wolfe, John N.; and Parekh, Navinchandra J. Breast compression and needle localization apparatus. 4,691,333, Cl. 378-37.000.

Gach, Paul: *See*—
Hull, A. Katherine, 4,690,852, Cl. 428-156.000.

Gaikema, Gjalt M.; and Zylstra, Dirk, to Wavin B.V. Process for the packaging of products, using a heat treatment, and closed container with packed products, obtained using a heat treatment. 4,689,936, Cl. 53-440.000.

Galco, Inc.: *See*—
Gallentine, William, 4,689,957, Cl. 60-481.000.

Gallentine, William, to Galco, Inc. Hydraulic tool system. 4,689,957, Cl. 60-481.000.

Gamarnik, Iosif I.: *See*—
Vernikov, Arkady Y.; Gamarnik, Iosif I.; Rashkovich, Mikhail P.; Trostanovsky, Boris A.; and Khinkus, Alexandr S., 4,691,183, Cl. 335-289.000.

Gandhi, Sharad P.: *See*—
Kronstadt, Eric P.; Gheewala, Tushar R.; and Gandhi, Sharad P., 4,691,277, Cl. 364-200.000.

Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Pinto, Patrick A.; and Versace, Richard W., to Schering Corporation. 2-(heterocycloalkylthio)penems. 4,690,922, Cl. 514-210.000.

Ganz, Robert H., to Mead Packaging Corporation, The. Apparatus for and method of applying wrap to article clusters. 4,689,934, Cl. 53-398.000.

Gappa, Takeshi: *See*—
Murakami, Gen; and Gappa, Takeshi, 4,691,225, Cl. 357-80.000.

Garcia, John G., Jr.: *See*—
Bhatia, Kishan; and Garcia, John G., Jr., 4,690,805, Cl. 423-224.000.

Gardner, Hugh C.: *See*—
Domeier, Linda A.; and Gardner, Hugh C., 4,691,025, Cl. 548-521.000.

Gardner, John F.; and Morton, Gerald H., to Xomox Corporation. Valve assembly and method of making same. 4,690,164, Cl. 137-15.000.

Gariboldi, Franco: *See*—
Conti, Paolo; Conti, Gianni; Gariboldi, Franco; and Manini, Benito, 4,689,971, Cl. 66-25.000.

Garlanov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., to NPK za Kontrolno Zavarachni Raboti. Method and device for plasma cutting of non-metallic materials. 4,691,090, Cl. 219-121.0PC.

Garrett, Brian D.: *See*—
Gupta, Chakra V.; and Garrett, Brian D., 4,691,081, Cl. 174-105.00R.

Garrett Corporation, The: *See*—
Shkedi, Zvi, 4,689,999, Cl. 73-708.000.

Gass, Karl: *See*—
Fory, Werner; Gass, Karl; and Meyer, Willy, 4,690,707, Cl. 71-93.000.

Gates, Alan H.: *See*—
Hedrick, Steven E.; and Gates, Alan H., 4,690,701, Cl. 55-436.000.

Gauckler, Ludwig: *See*—
Rieger, Wolfhart; Gauckler, Ludwig; Maurer, Albert; and Kampfer, Konrad, 4,690,763, Cl. 210-496.000.

Gaudilliere, Bernard: *See*—
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, 4,690,931, Cl. 514-317.000.

Gauthier, Michel; and Fauteux, Denis, to Hydro-Quebec; and Societe Nationale Elf Aquitaine. Process for preparing alloyed negative electrodes. 4,690,840, Cl. 427-436.000.

Gayfer, David; Starkey, Stanley V.; and Wareham, John G., to Molins PLC. Packet handling apparatus. 4,690,265, Cl. 198-347.000.

Gee, Caroline M.; and Thurmond, Gary D., to Hughes Aircraft Company. Compensation for optical damage of directional-coupler switches. 4,690,488, Cl. 350-96.120.

Gehring, Fritz; Roth, Siegfried; and Semrau, Hans-Juergen, to Lindauer Dornier Gesellschaft mbH. Gripper rod for shuttleless looms. 4,690,177, Cl. 139-449.000.

Geise, Samuel C., to Specialty Tool Co., Inc. Slitting tool. 4,689,920, Cl. 51-241.00S.

General DataComm, Inc.: *See*—
Robinson, Jeffrey I., 4,691,190, Cl. 340-347.0AD.
General Electric Company: *See*—
Cella, James A.; Grade, Marsha M.; and Evans, Thomas L., 4,690,997, Cl. 528-26.000.
Hershberger, Doran D., 4,689,973, Cl. 68-23.700.
Hsiung, Chia Y.; and Ross, Daniel P., 4,691,176, Cl. 331-2.000.
Knoble, David W.; and Sanders, Joseph W., 4,691,341, Cl. 379-97.000.
Komanduri, Ranga, 4,690,691, Cl. 51-293.000.
Scott, Curtis E.; and McVey, Charles I., 4,690,727, Cl. 156-635.000.
Steele, Douglas S., 4,691,108, Cl. 250-385.000.
General Electric Environmental Services, Inc.: *See*—
Saleem, Abdus, 4,690,807, Cl. 423-242.000.
General Motors Corporation: *See*—
Arnold, Philip D., 4,690,112, Cl. 123-195.00R.
General Oceanics, Inc.: *See*—
Niskin, Shale J.; and Williams, Gerald J., 4,690,380, Cl. 254-394.000.
Genet, Alain: *See*—
Grollier, Jean-Francois; Cotteret, Jean; Junino, Alex; and Genet, Alain, 4,690,685, Cl. 8-405.000.
Genus, Inc.: *See*—
McInerney, Edward J.; Dornseif, E. Ronald; and Zetterquist, Norman E., 4,690,746, Cl. 204-192.320.
Georg Fischer Aktiengesellschaft: *See*—
Steinemann, Robert, 4,690,163, Cl. 137-8.000.
George, Achilles N. Inversion apparatus. 4,690,133, Cl. 128-25.00R.
George Blair Public Limited Company: *See*—
Reynard, Kenneth, 4,690,442, Cl. 292-218.000.
George, Flint R.; and Smith, Marlin R., to Halliburton Company. Gun firing head. 4,690,227, Cl. 175-4.560.
Georgiev, Vassil S.; and Mullen, George B., to Pennwalt Corporation. Adamantyl phenyl β-alanines. 4,691,051, Cl. 562-443.000.
Gerd Schulz Fahrzeug- und Container-Technik: *See*—
Schulz, Gerd, 4,690,232, Cl. 180-89.140.
Gerow, Frank J., to Synergist Limited. Male impotence prosthesis. 4,690,135, Cl. 128-79.000.
Gerritsen, Jan; and Mensies, Otto, to U.S. Philips Corporation. Display tube having ferromagnetic field shapers to prevent beam defocussing. 4,691,139, Cl. 313-413.000.
Geus, Georg. to Heimann GmbH. Inverse rectifier. 4,691,272, Cl. 363-98.000.
Gevaza, Jury I.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.
Gheewala, Tushar R.: *See*—
Kronstadt, Eric P.; Gheewala, Tushar R.; and Gandhi, Sharad P., 4,691,277, Cl. 364-200.000.
Ghini, Mario, to IN.GR.ED. Industrie Grafiche Editoriali S.p.A. Blank for parallelepiped dispensing carton. 4,690,282, Cl. 206-626.000.
Giammara, Beverly L.; and Hanker, Jacob S., to University of North Carolina at Chapel Hill, The; and Microelectronics Center of North Carolina. Silver methenamine staining method. 4,690,901, Cl. 436-86.000.
Giannini, Gabriel M. Optical fiber magnetic connector. 4,690,495, Cl. 350-96.210.
Gibbons, Carl B. Insulated flexible bladder solar collector. 4,690,128, Cl. 126-450.000.
Gibson, Royce G., to Tendapak Holdings Pty. Limited. Material forming apparatus. 4,689,856, Cl. 17-32.000.
Giesberg, Daniel J. Film illuminator. 4,691,267, Cl. 362-218.000.
Gila River Products, Inc.: *See*—
Kloss, Thomas M., Jr., 4,690,845, Cl. 428-40.000.
Gilbert, Bibaut. Earth digging machine for use on soft or undulating terrain, particularly for the clearing of ponds, swamps or canals. 4,689,903, Cl. 37-103.000.
Gilbert, David L.: *See*—
Hughes, Brett A.; Gilbert, David L.; and Ellerbrock, Eugene A., 4,689,868, Cl. 29-523.000.
Gilbert, Joseph H.: *See*—
Everman, Wayne H.; and Gilbert, Joseph H., 4,690,732, Cl. 202-100.000.
Gill, David C., to Nomix Manufacturing Co. Limited. Spraying equipment. 4,690,326, Cl. 239-223.000.
Gilliom, Laura R.: *See*—
Grubbs, Robert H.; Gilliom, Laura R.; and Siove, Alain, 4,690,992, Cl. 526-160.000.
Gillissen, Franz. Process for the generation plasma and an MHD generator. 4,691,130, Cl. 310-11.000.
Gillum, Richard R., to Weapon Technology System R & D Ltd. Handheld high-velocity grenade launcher. 4,689,912, Cl. 42-105.000.
Gilson, Jean-Pierre: *See*—
Engel, Dusan J.; and Gilson, Jean-Pierre, 4,691,063, Cl. 568-783.000.
Gingerich, Richard G. W.: *See*—
Scheithauer, Richard A.; Vanderpool, Clarence D.; Miller, Michael J.; and Gingerich, Richard G. W., 4,690,710, Cl. 75-0.5AA.
Girijavallabhan, Viyyoor M.: *See*—
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Pinto, Patrick A.; and Versace, Richard W., 4,690,922, Cl. 514-210.000.
Gissinger, Patrick; and Poutignat, Yves, to Ceraver. Device for stripping from a mold a composite electrical insulator. 4,690,630, Cl. 425-236.000.
Giuliano, James T., to Zotos International, Inc. Form for preparing artificial nails. 4,690,369, Cl. 249-55.000.
Glad, Thomas: *See*—
Fukahori, Kiyoshi; and Glad, Thomas, 4,691,172, Cl. 330-129.000.
Glaser, Eberhard: *See*—
Nussbaumer, Manfred; Glaser, Eberhard; and Beitinger, Eberhard, 4,690,590, Cl. 405-267.000.
Glass, Samuel W., III, to Babcock & Wilcox Company, The. Calibration impact hammer. 4,689,985, Cl. 73-1.00R.
Glasscock, Michael R.: *See*—
Hines, Robin H.; Glasscock, Michael R.; and Johnson, D. Bruce, 4,690,025, Cl. 84-1.180.
Glaxo Group Limited: *See*—
Knight, David J.; Scopes, David I. C.; Storer, Richard; and Holman, Stuart, 4,690,917, Cl. 514-23.000.
Glenwood Systems U.S.A., Ltd.: *See*—
Showers, David F., 4,690,433, Cl. 283-1.00B.
GN/PI de Luigi Granieri e Figli, S.n.c.: *See*—
Granieri, Luigi, 4,689,925, Cl. 52-94.000.
Gob, Werner; and Anders, Peter, to Fichtel & Sachs AG. Viscous fan coupling unit. 4,690,103, Cl. 123-41.120.
Goczalk, Robert W.: *See*—
Mollett, Larry R.; and Goczalk, Robert W., 4,691,173, Cl. 330-144.000.
Godo Steel, Ltd.: *See*—
Takai, Kiyoshi; and Kaseya, Akinori, 4,690,327, Cl. 239-226.000.
Goetz, Harold E. Paper roll holder with tension arm. 4,690,343, Cl. 242-55.300.
Goko, Hiroshi: *See*—
Onoda, Yoshimitsu; and Goko, Hiroshi, 4,690,251, Cl. 187-107.000.
Gold, Elijah H.: *See*—
Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,691,049, Cl. 562-553.000.
Gold, Jeffrey W., to Integrated Environmental Services. Cylinder rupture vessel. 4,690,180, Cl. 141-51.000.
Gold Star Co., Ltd.: *See*—
Park, Jong D., 4,690,439, Cl. 292-27.000.
Gold Start Co., Ltd.: *See*—
Lee, Hee J., 4,691,087, Cl. 219-10.55B.
Goldberg, Mel. Noise making mask. 4,690,653, Cl. 446-27.000.
Golden Valley Microwave Foods Inc.: *See*—
Watkins, James D.; and Andreas, David W., 4,691,374, Cl. 383-104.000.
Goldstein, Bernard: *See*—
Dinkel, Nancy A.; Goldstein, Bernard; and Ettenberg, Michael, 4,691,320, Cl. 372-45.000.
Goldstein, Gideon: *See*—
Kung, Patrick C.; and Goldstein, Gideon, 4,691,010, Cl. 530-387.000.
Goldstein, Samuel M.: *See*—
Crosson, Peter; Sanchez, Terry; Gray, Kevin; and Goldstein, Samuel M., 4,690,658, Cl. 446-429.000.
Gomibuchi, Reizo: *See*—
Tomibe, Shinji; Gomibuchi, Reizo; Takahashi, Kiyofumi; and Kato, Noboru, 4,690,854, Cl. 428-195.000.
Goodard, Errol D.: *See*—
Ananthapadmanabhan, Kavssery P.; and Goodard, Errol D., 4,690,892, Cl. 435-183.000.
Goodyear Tire & Rubber Company, The: *See*—
Bradisse, John L.; and Lindner, Daniel J., 4,690,189, Cl. 152-209.00R.
Goossens, Jan B.: *See*—
Kleijne, Theodoor A.; and Goossens, Jan B., 4,691,350, Cl. 380-3.000.
Gordon, Roy G. Protective overcoat of titanium nitride films. 4,690,871, Cl. 428-432.000.
Gorno-Altaisky Gosudarstvenny Pedagogichesky Institut: *See*—
Lebedev, Jury A., 4,690,460, Cl. 299-21.000.
Gossen Corporation: *See*—
Hoffmann, Daniel J., 4,690,862, Cl. 428-318.600.
Goth, George R., to International Business Machines Corporation. Self-aligned polysilicon base contact structure. 4,691,219, Cl. 357-34.000.
Goto, Tokuju; Tanaka, Itsuo; Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Electrode plate for generating plasma. 4,691,137, Cl. 313-30.000.
Goudeaux, James L.; and Olivier, Eric J. Slurry sandblasting system. 4,689,923, Cl. 51-410.000.
Gourmel, Yves; and Pierrel, Michel, to Pont-a-Mousson S.A. Apparatus for the rotary supply of molten cast-iron to an installation for the vertical continuous casting of a pipe from spheroidal graphite cast-iron. 4,690,199, Cl. 164-421.000.
Goyak, George M.: *See*—
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,690,894, Cl. 435-244.000.
Grace, Oscar M.: *See*—
Ramlow, Gerhard G.; Heyman, Duane A.; and Grace, Oscar M., 4,690,956, Cl. 521-137.000.
Grade, Marsha M.: *See*—
Cella, James A.; Grade, Marsha M.; and Evans, Thomas L., 4,690,997, Cl. 528-26.000.

Gradoboev, Vladimir T.; Sitnikov, Alexandr E.; Klimenov, Alexandr M.; and Melnikov, Leonid I. Charging-and-conveying means. 4,690,267, Cl. 198-396.000.

Granell, Jose O. O.: *See*—
Arechaga, Sabastian J.; Granell, Jose O. O.; Linan, Carmen S.; Vallejo, Alfonso P.; and Gabarro, Jose A. P., 4,690,945, Cl. 514-448.000.

Graner, Joseph R., to Heyl & Patterson, Inc. Car dumping apparatus. 4,690,603, Cl. 414-372.000.

Granier, Georges; and Valliere, Yves, to Societe Nationale des Poudres et Explosifs. Ultrarapid gas generator with increased safety. 4,690,063, Cl. 102-530.000.

Granieri, Luigi, to GN/PI de Luigi Granieri e Figli, S.n.c. In a building a cornice between a wall and a ceiling both made of modular panels. 4,689,925, Cl. 52-94.000.

Grant, Alan H. Barbed lid closure. 4,690,291, Cl. 215-32.000.

Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., to Industrial Holographics, Inc. Optical method and apparatus for strain analysis. 4,690,552, Cl. 356-35.500.

Grass, Alfred. Panel adjustment device for the front panel of drawers or the like. 4,690,469, Cl. 312-330.00R.

Gray, Kevin: *See*—
Crosson, Peter; Sanchez, Terry; Gray, Kevin; and Goldstein, Samuel M., 4,690,658, Cl. 446-429.000.

Greatrake, Scott E.: *See*—
Faulconer, Mark; and Greatrake, Scott E., 4,690,314, Cl. 224-211.000.

Green Ball Bearing Company, The: *See*—
Green, Bernard, 4,690,574, Cl. 384-569.000.

Green, Bernard, to Green Ball Bearing Company, The. Bearing and method for rotatably supporting a worn shaft. 4,690,574, Cl. 384-569.000.

Green, William J.; and Semmerling, Ralph P., to USG Industries, Inc. Walkway for a sloping rooftop. 4,689,927, Cl. 52-180.000.

Greenberger, Susan; and Horwich, Kate B., to Homebodies, Inc. Convertible garment. 4,689,831, Cl. 2-93.000.

Greenwood, John C.; Hodges, Robert J.; and Sheppard, Robert, to International Standard Electric Company. Switch device. 4,691,117, Cl. 307-119.000.

Greenzang, Fred: *See*—
Castaldi, John; and Greenzang, Fred, 4,690,602, Cl. 414-282.000.

Gregan, David J.; and Crowter, Ronald H., to National Dairy Association of N.Z., The. Pulsation arrangement. 4,690,099, Cl. 119-14.410.

Gregorich, Edward E.; and Maher, Timothy R., to Stemco, Inc. Flattened venturi, method and apparatus for making. 4,690,245, Cl. 181-272.000.

Gregory, James A.; Hanoka, Jack I.; and Vayman, Zinovy Y., to Mobil Solar Energy Corporation. Antireflection coatings for silicon solar cells. 4,691,077, Cl. 136-256.000.

Grieser, Fritz: *See*—
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.0SC.

Griffen, Neil C., to Reliance Electric Company. Creep-compensated weighing apparatus. 4,691,290, Cl. 364-567.000.

Grise, Frederick G. J., to Flexwatt Corporation. System for transversely aligning a substrate. 4,690,347, Cl. 242-57.100.

Grollier, Jean-Francois; Cotteret, Jean; Junino, Alex; and Genet, Alain, to L'Oreal. Dyeing composition for keratinous fibres containing at least one co-solubilized N-substituted 2-nitro-para-phenylenediamine. 4,690,685, Cl. 8-405.000.

Gros, Pierre: *See*—
Duheille, Jean; Pau, Bernard; and Gros, Pierre, 4,690,906, Cl. 436-512.000.

Grosso, Vincent A.; Estlick, Raymond J.; and Zarr, William A., to Raytheon Company. Despinning mechanism. 4,690,350, Cl. 244-3.100.

Grosso, Vincent A.: *See*—
Beckerleg, Richard A.; Fernald, Mark R.; LaTorre, Richard R.; and Grosso, Vincent A., 4,690,351, Cl. 244-3.160.

Grothaus, Roger H.; and Hildebrandt, Donald W., to S. C. Johnson & Son, Inc. Trap for houseflies. 4,689,915, Cl. 43-112.000.

Grubbs, Robert H.; Gilliom, Laura R.; and Siove, Alain, to California Institute of Technology. Polymerization of difunctional ring compounds. 4,690,992, Cl. 526-160.000.

Gruenspecht, Mark J.: *See*—
Samson, Sam; and Gruenspecht, Mark J., 4,690,651, Cl. 441-56.000.

Grumman Aerospace Corporation: *See*—
Barton, Richard O.; Bergin, Michael T.; and Miller, John M., 4,690,563, Cl. 356-375.000.
Miller, John; Barton, Richard O.; and Schaefer, Oscar H., 4,690,365, Cl. 248-650.000.

Grunert, Kurt A.; and Changle, Joseph F., to Westinghouse Electric Corp. Circuit breaker with electrical disconnect means. 4,691,180, Cl. 335-6.000.

GTE Communication Systems Corporation: *See*—
Koppensteiner, James V.; and Kubik, Charles K., 4,690,356, Cl. 248-68.100.

GTE Laboratories Incorporated: *See*—
Buhrer, Carl F.; and Feuersanger, Alfred E., 4,691,141, Cl. 313-565.000.

GTE Products Corporation: *See*—
Brower, Boyd G., 4,690,637, Cl. 431-359.000.
Coad, Brian C., 4,690,711, Cl. 75-244.000.
Dobbs, Robert J.; and Alexander, Shuford M., Jr., 4,690,693, Cl. 51-307.000.
Edmiston, Charles G., 4,690,791, Cl. 264-122.000.
Mizuhara, Howard, 4,690,876, Cl. 428-606.000.
Paliwal, Muktesh, 4,690,796, Cl. 419-12.000.
Scheithauer, Richard A.; Vanderpool, Clarence D.; Miller, Michael J.; and Gingerich, Richard G. W., 4,690,710, Cl. 75-0.5AA.
Yale, Ramon L., 4,690,832, Cl. 427-65.000.

Guillin, Daniel: *See*—
Bouteille, Daniel; Nicolas, Michel; and Guillin, Daniel, 4,690,035, Cl. 91-442.000.

Gulick, Paul E.: *See*—
King, Christopher N.; Dolinar, Brian J.; Barrow, William A.; Flegal, Robert T.; Gulick, Paul E.; and Blacken, Laurin G., 4,691,144, Cl. 315-169.300.

Gunther, Dieter, to Hoechst Aktiengesellschaft. 3-halogenoacetonesulfonamides and a process for their preparation. 4,691,056, Cl. 564-96.000.

Gupta, Chakra V.; and Garrett, Brian D., to Comm/Scope Company. Electrical cable with improved metallic shielding tape. 4,691,081, Cl. 174-105.00R.

Gurries, Richard M.: *See*—
Schwartz, Arthur G.; Gurries, Richard M.; and Johnson, Jay K., 4,690,697, Cl. 55-84.000.

Gustafsson, Paul, to AB Tico. Device of the kind comprising at least three movably co-ordinated parts. 4,690,290, Cl. 212-267.000.

Gwinn, Mack W., Jr. Small arm magazine. 4,689,907, Cl. 42-50.000.

Haaland, Per, to Mehren Rubber A/S. Means for sealing the gap between two axially displaceable sealing surfaces. 4,690,414, Cl. 277-207.00A.

Haard, Norman F.; and Patel, Thakor R., to Canadian Patents and Development Limited. Bacterial enzyme used as cheese ripening aid. 4,690,826, Cl. 426-36.000.

Haarmann, Walter: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,690,923, Cl. 514-222.000.

Haarsma, John: *See*—
Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,690,780, Cl. 252-572.000.

Habecker, John W.; and Black, Charles E., III, to Indak Manufacturing Corp. Pushbutton electrical switch having a flairing contactor loosely rotatable on a spring-biased eyelet. 4,691,086, Cl. 200-159.00R.

Hacke, Heinz: *See*—
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.

Hacknauer, Frank; DeFazio, Salvatore C.; and Fox, Richard S., to Eastman Kodak Company. Magnetic brush development apparatus having a gating and metering mechanism. 4,690,096, Cl. 118-657.000.

Haddy, Michael L., to Hydrotile Machinery Company. Packerhead with elastic rollers. 4,690,631, Cl. 425-262.000.

Hadjis, Constantin. System and method for raising sunken vessels. 4,690,087, Cl. 114-50.000.

Hagen, Kenneth G.: *See*—
Taylor, Bruce F.; and Hagen, Kenneth G., 4,689,895, Cl. 321-20.000.

Hahn, Clive E. W.: *See*—
Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., 4,690,562, Cl. 356-361.000.

Hahn, Joseph J.: *See*—
Nee, John D.; and Hahn, Joseph J., 4,690,593, Cl. 408-80.000.

Hahn, Karl W.: *See*—
McGreevy, Francis T.; and Hahn, Karl W., 4,690,684, Cl. 623-12.000.

Hahn, Michael; and Kuntze-Fechner, Gerald, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Rotor structure, especially for rotary wing aircraft. 4,690,616, Cl. 416-134.00A.

Hahn, Michael: *See*—
Kuntze-Fechner, Gerald; Friedberger, Otmar; and Hahn, Michael, 4,690,615, Cl. 416-134.00A.

Hahnfeld, Jerry L., to Dow Chemical Company, The. Blends of olefinic and monovinylidene aromatic polymers. 4,690,976, Cl. 525-70.000.

Haijkens, Bernardus: *See*—
Dijkstra, Arend; Haijkens, Bernardus; and Veenstra, Mient, 4,691,134, Cl. 310-234.000.

Haken, Roger A.: *See*—
Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; Holloway, Thomas C.; and Bell, David A., 4,690,730, Cl. 156-643.000.

Halabisky, Donald D.; and Dudley, Dwight A., II, to Weyerhaeuser Company. Reinforced container. 4,690,835, Cl. 427-210.000.

Hale, Charles S.; Matzkin-Bridger, Andrew; and Morse, Ronald W., to Allied Corporation. Hermetically sealed fiber optic connector. 4,690,487, Cl. 350-96.210.

Hale Fire Pump Company: *See*—
Eberhardt, H. Alfred, 4,690,613, Cl. 415-148.000.

Hall, Mark J.: *See*—
Tomalia, Donald A.; and Hall, Mark J., 4,690,985, Cl. 525-419.000.

Hall, Thomas E.: *See*—
Rahrig, Thomas F.; and Hall, Thomas E., 4,690,478, Cl. 439-271.000.

Halliburton Company: *See*—
Cole, R. Clay; and Bowles, Bobby K., 4,690,961, Cl. 523-440.000.
George, Flint R.; and Smith, Marlin R., 4,690,227, Cl. 175-4.560.
Schultz, Ward E.; and Smith, Harry D., Jr., 4,691,102, Cl. 250-256.000.
Sumner, Cyril R., 4,690,218, Cl. 166-297.000.

Halstead, Christopher, to Myson Heating Limited. Terminal unit for a balanced flue. 4,690,129, Cl. 126-85.00B.

Hamilton, Douglas D.; Palfy, Robert M.; and Viereck, Hans, to Logging Development Corporation. Rim driven rotary cutter and tree felling head incorporating the same. 4,690,185, Cl. 144-34.00R.

Hamisch, Paul H., Jr.; Makley, James A.; Pabodie, Robert M.; and Strausburg, Larry D., to Monarch Marking Systems, Inc. Hand-held tag attacher. 4,690,317, Cl. 227-67.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand-held labeler. 4,690,723, Cl. 156-541.000.

Hammer, Donald R.: *See*—
Stein, David E.; and Hammer, Donald R., 4,690,491, Cl. 350-96.160.

Hammer, Richard B.: *See*—
Donson, William A.; Ellerson, James V.; Hammer, Richard B.; Lafer, William; and Snyder, Keith A., 4,690,833, Cl. 427-96.000.

Hammond, Philip G., to Kimberly-Clark Corporation. Absorbent structure containing a contoured batt. 4,690,853, Cl. 428-157.000.

Hamsher, Wilbur A., Jr.; and Long, William B., to AMP Incorporated. Electrical contact for receiving two conductors. 4,690,647, Cl. 439-92.000.

Han, Doyoung; and Renaud, Merle A., to American Standard Inc. Control and method for modulating the capacity of a temperature conditioning system. 4,689,967, Cl. 62-201.000.

Hanafusa, Hiroyuki: *See*—
Nakayama, Hideo; Nakatani, Shuichi; Tanaka, Fusatoshi; and Hanafusa, Hiroyuki, 4,690,106, Cl. 123-52.00M.

Haney, Ronald E.: *See*—
Levine, Jules D.; Jensen, Millard J.; and Haney, Ronald E., 4,691,076, Cl. 136-250.000.

Hanker, Jacob S.: *See*—
Giammara, Beverly L.; and Hanker, Jacob S., 4,690,901, Cl. 436-86.000.

Hanoka, Jack I.: *See*—
Gregory, James A.; Hanoka, Jack I.; and Vayman, Zinovy Y., 4,691,077, Cl. 136-256.000.

Hansel, James G.: *See*—
Roberts, George W.; Hansel, James G.; and Shahani, Goutam H., 4,690,215, Cl. 166-261.000.

Hansen, David E.; Kelbe, Richard R.; and Wolcott, Dana W., to Eastman Kodak Company. Low cost telephoto and normal lens camera with an extendable flash. 4,690,531, Cl. 354-149.110.

Hara, Kazumasa; Koike, Mikio; and Sasano, Akiyoshi, to Janome Sewing Machine Co. Ltd. Automatic upper thread tension control for a sewing machine. 4,690,083, Cl. 112-254.000.

Hara, Kazumasa: *See*—
Eguchi, Yasukata; Hara, Kazumasa; and Hisatake, Michio, 4,690,082, Cl. 112-254.000.

Hara, Rikio: *See*—
Ito, Bunsaku; Fukuda, Kimio; and Hara, Rikio, 4,690,856, Cl. 428-215.000.

Hara, Ryuichiro: *See*—
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.

Harada, Mitsuo: *See*—
Ohguma, Hirotsugu; Harada, Mitsuo; Saura, Hideaki; and Yasuda, Satoshi, 4,689,970, Cl. 62-514.00R.

Harada, Tatsuo: *See*—
Kita, Toshiaki; and Harada, Tatsuo, 4,690,506, Cl. 350-320.000.

Harada, Yoshihito: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,690,532, Cl. 354-173.110.

Haragashira, Motoji, to Kabushiki Kaisha Toshiba. Nuclear magnetic resonance transmitter and receiver system. 4,691,164, Cl. 324-322.000.

Hardey, Donald H.; and Austin, Franklin D., to Castech Enterprises, Inc. Injector for injecting molten material into a die. 4,690,198, Cl. 164-316.000.

Hardin, Roy T., Jr.; and Marshall, James R., to Westinghouse Electric Corp. Emergency transfer tube closure and process for sealing transfer tube under emergency conditions. 4,690,795, Cl. 376-264.000.

Harding, Audrey E. Antiseptic glove. 4,689,935, Cl. 53-431.000.

Hardwicke Chemical Company: *See*—
Hardwicke, James E., III, 4,691,033, Cl. 549-453.000.

Hardwicke, James E., III, to Hardwicke Chemical Company. Process for preparing 3-phenoxybenzaldehydes. 4,691,033, Cl. 549-453.000.

Harenza, Edward R.: *See*—
Fadner, Thomas A.; Harenza, Edward R.; Hycner, Stanley H.; and Robinson, Nelson M., 4,690,055, Cl. 101-451.000.

Harold Beck & Sons, Inc.: *See*—
Kihm, Joe A., 4,690,168, Cl. 137-554.000.

Harris Corporation: *See*—
Cox, Eugene R., 4,691,222, Cl. 357-50.000.
Durston, Thomas W., 4,691,336, Cl. 379-21.000.

Harris, J. Milton: *See*—
Van Alstine, James M.; Harris, J. Milton; Shafer, Steve; Snyder, Robert S.; and Herren, Blair, 4,690,749, Cl. 204-299.00R.

Harris, Patrick C.; and Wilcox, John A., to Beecham Group p.L.c. Process for producing 3-thienylmalonic acid. 4,691,029, Cl. 549-79.000.

Harrison, Reginald, to Dunlop Limited. Pneumatic vehicle suspension with failsafe internal stop. 4,690,388, Cl. 267-35.000.

Harrison, William H.: *See*—
Rubin, Llewellyn A.; and Harrison, William H., 4,691,203, Cl. 340-856.000.

Harsanyi, Kalman: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Osaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

Hart, James E., to American Standard Inc. Freight brake control valve having an emergency piston slide valve arranged to provide an accelerated brake application function. 4,690,463, Cl. 303-37.000.

Hartler, Nils J. C.; Lekander, Karl-Erik; Sjodin, Lars T.; and Mjoberg, Per J., to Sunds Defibrator Aktiebolag. Method of making sulphate pulp. 4,690,731, Cl. 162-45.000.

Hartley, Richard A. Security striker plate. 4,690,445, Cl. 292-341.000.

Hartz Mountain Corporation, The: *See*—
Suchowski, Bernard, 4,689,860, Cl. 24-239.000.

Harvey, Dennis N.; and Bertolasi, Robert B., to MTS Systems Corporation. Optical displacement transducer usable as an extensometer. 4,690,001, Cl. 73-800.000.

Hasegawa, Hisayasu: *See*—
Fukuma, Nobuo; Hasegawa, Hisayasu; Murayama, Kimimasa; Hayashi, Kunio; and Tokudome, Yoshihiro, 4,689,864, Cl. 29-157.10R.

Hasegawa, Isao; Yoshikawa, Kikuo; Takagi, Satoshi; and Takahashi, Akira, to Clarion Co., Ltd. Channel changing mechanism in a tape player. 4,691,261, Cl. 360-137.000.

Hasegawa, Shizuo; and Hayashi, Kimiyoshi, to Canon Kabushiki Kaisha. Original reader with variable magnification and time delay. 4,691,114, Cl. 250-578.000.

Hasegawa, Toshihiko: *See*—
Hosoi, Hideki; Hasegawa, Toshihiko; and Aoyama, Taizo, 4,690,977, Cl. 525-83.000.

Hasenwinkle, Earl D., to Weyerhaeuser Company. Variable curve linebar with skewable saws. 4,690,188, Cl. 144-378.000.

Hashima, Akio: *See*—
Honjo, Masahiro; and Hashima, Akio, 4,691,247, Cl. 358-319.000.

Hashimoto, Haruto: *See*—
Okada, Takeshi; Hashimoto, Haruto; and Uemura, Michihiko, 4,691,178, Cl. 333-143.000.

Hashimoto, Hiroshi: *See*—
Okita, Tsutomu; Tsuji, Nobuo; Hashimoto, Hiroshi; and Mukaida, Yoshito, 4,690,870, Cl. 428-425.900.

Hashimoto, Kazuhiko, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit with an internal voltage converter circuit. 4,691,123, Cl. 307-296.00R.

Hashimoto, Mashataka: *See*—
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Hashimoto, Takafumi; Kamanaka, Yoshihide; and Ashikaga, Tadashi, to Kabushiki Kaisha Meidensha. Method of operating a secondary battery to recondition the battery. 4,691,158, Cl. 320-14.000.

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Hashimoto, Yasuyuki, to Kabushiki Kaisha Daikin Seisakusho. Damper disc. 4,690,660, Cl. 464-68.000.

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Yamane, Takehiko; Hashizume, Takuji; Yamashita, Katsuji; and Watanabe, Kiyoshi, 4,690,919, Cl. 514-183.000.

Haskell, Richard E.: *See*—
Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., 4,690,552, Cl. 356-35.500.

Haslim, Leonard A.; and Lee, Robert D., to United States of America, National Aeronautics and Space Administration. Electro-expulsive separation system. 4,690,353, Cl. 244-134.00D.

Hasumi, Shunji: *See*—
Kagatani, Seiya; Hasumi, Shunji; Sonobe, Takashi; and Aruga, Masayoshi, 4,690,952, Cl. 514-808.000.

Hata, Stephen S.: *See*—
Haunschild, Susan M.; Hata, Stephen S.; and Wismer, Shirlee A., 4,690,681, Cl. 604-396.000.

Hata, Takehisa; Kanagawa, Nobuto; Morishita, Takashi; and Suzuki, Toshiyuki, to Fujisawa Pharmaceutical Co., Ltd.; and Morishita Jintan Co., Ltd. Type soft capsule. 4,690,816, Cl. 424-456.000.

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Kaneko, Masahide; Hatori, Yoshinori; and Miyasato, Tsutomu, 4,691,230, Cl. 358-105.000.

Hattori, Hideki: *See*—
Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, 4,690,764, Cl. 210-629.000.

Hattori, Shintaroo: *See*—
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.

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Murate, Shigenori; and Hattori, Yoshinori, 4,689,921, Cl. 51-317.000.
Haukaas, Duane C. Rod weeder attachment for an agricultural implement. 4,690,223, Cl. 172-44.000.
Haunschild, Susan M.; Hata, Stephen S.; and Wismer, Shirlee A., to Kimberly-Clark Corporation. Disposable leakproof catamenial device. 4,690,681, Cl. 604-396.000.
Hauser, Thomas A., to Caldwell Co., Inc., The. Hook with safety latch. 4,689,859, Cl. 24-233.000.
Havemann, Kim: *See*—
von Sivers, Rolf; Havemann, Kim; and Ilsemann, Bernhard, 4,690,238, Cl. 180-248.000.
Hawkins, David M.: *See*—
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., 4,690,604, Cl. 414-403.000.
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Optical semiconductor apparatus. 4,691,214, Cl. 357-17.000.
Hayami, Hiroyuki; and Utsumi, Atsushi, to Dainichi-Nippon Cables, Ltd. Optical multiple fiber. 4,690,500, Cl. 350-96.250.
Hayashi, Eiji: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.
Hayashi, Kimiyoshi: *See*—
Hasegawa, Shizuo; and Hayashi, Kimiyoshi, 4,691,114, Cl. 250-578.000.
Hayashi, Kunio: *See*—
Fukuma, Nobuo; Hasegawa, Hisayasu; Murayama, Kimimasa; Hayashi, Kunio; and Tokudome, Yoshihiro, 4,689,864, Cl. 29-157.10R.
Hayashi, Sadao, to Asahi Gomu Kako Kabushiki Kaisha. Flexible dumbbell. 4,690,399, Cl. 272-122.000.
Hayashi, Toshihide; Kanayama, Ikuo; and Kanno, Masayoshi, to Sony Corporation. Television signal receiving apparatus. 4,691,351, Cl. 380-10.000.
Hayashi, Tsunekazu: *See*—
Iwasaki, Takashi; Tomita, Yasuo; and Hayashi, Tsunekazu, 4,690,839, Cl. 427-366.000.
Hayden, Howard L.; Vaghani, Vallabh V.; and Readman, John, to Sundstrand Corporation. Rotating shaft electrical connection. 4,690,470, Cl. 439-13.000.
Hayes, Kathryn S.: *See*—
Veazey, Richard L.; and Hayes, Kathryn S., 4,690,982, Cl. 525-331.900.
Veazey, Richard L.; and Hayes, Kathryn S., 4,690,983, Cl. 525-331.900.
Hebbinghaus, Walter: *See*—
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.
Hebrock, Steve: *See*—
Reichel, Kenneth R.; and Hebrock, Steve, 4,691,349, Cl. 379-391.000.
Hedrick, Steven E.; and Gates, Alan H. Reusable grease filter. 4,690,701, Cl. 55-436.000.
Heefner, Donald L.: *See*—
Squires, Charles H.; Heefner, Donald L.; Evans, Ronald J.; Kopp, Beatrice J.; and Yarus, Michael J., 4,690,897, Cl. 435-320.000.
Heffern, Edward W.: *See*—
Taggart, Davis L.; and Heffern, Edward W., 4,690,217, Cl. 166-274.000.
Hegedus, Bela: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Osaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.
Hegemann, Gunther; and Miedeck, Karin, to BASF Farben & Fasern AG. Unsaturated homo- and/or copolymerizable polyesters. 4,691,002, Cl. 528-289.000.
Hehl, Karl. Pipe coupling. 4,690,436, Cl. 285-321.000.
Heidelberger Druckmaschinen AG: *See*—
Maul, Bernhard; Zobl, Gunter; and Kusch, Hans-Jurgen, 4,690,394, Cl. 271-11.000.
Heideman, Robert J., to Enertrols, Inc. Compact shock absorber. 4,690,255, Cl. 188-287.000.
Heil Co., The: *See*—
Johnson, Gary, 4,690,607, Cl. 414-517.000.
Heimas, Naftali. Apparatus for hollow concrete wall construction. 4,690,368, Cl. 249-37.000.
Heimann GmbH: *See*—
Dunisch, Ingo, 4,690,652, Cl. 445-28.000.
Geus, Georg, 4,691,272, Cl. 363-98.000.
Heimerl, Wilfried; and Ewest, Eckhart, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Method of filling a metal vessel with a glass melt containing highly radioactive fission products. 4,690,781, Cl. 252-633.000.
Hein, Theo, to Mannesmann Rexroth GmbH. Drive system comprising an adjustable hydrostatic machine. 4,689,956, Cl. 60-449.000.
Heine, Heinrich: *See*—
Wahle, Bernd; Freitag, Dieter; Uerdingen, Walter; Heine, Heinrich; and Blazejak, Manfred, 4,690,998, Cl. 528-96.000.
Held-Elbert, Gabriele; Kaiser, Wolfgang; and Schmutzler, Werner, to Siemens Aktiengesellschaft. Method and apparatus for determining the value of analog voltages occurring on telephone subscriber lines of a digital telephone exchange. 4,691,337, Cl. 379-24.000.
Helenius, Kari H.: *See*—
Kimmo, Kayhko; and Helenius, Kari H., 4,690,900, Cl. 436-47.000.
Helgeland, Olav, to Tangberg Data A/S. Adjustable stand for a visual display unit. 4,690,362, Cl. 248-404.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Jeschke, Peter; Altenschoepfer, Theodor; Jacobs, Jochen; and Schumann, Klaus, 4,690,770, Cl. 252-99.000.
Henkin, Melvyn L.; and Laby, Jordan M. Tap water powered hydrotherapy method and apparatus. 4,689,839, Cl. 4-542.000.
Henning, John C., to Product Investment Incorporated. Safety closure. 4,690,292, Cl. 215-201.000.
Henning, Rainer; and Urbach, Hansjorg, to Hoechst Aktiengesellschaft. Process for the preparation of monocyclic, bicyclic and tricyclic aminoacids. 4,691,022, Cl. 548-408.000.
Henrion, Romain: *See*—
Denier, Guy; and Henrion, Romain, 4,690,386, Cl. 266-44.000.
Herb, Armin, to Hilti Aktiegesellschaft. Expansion dowel. 4,690,598, Cl. 411-40.000.
Herb, Rudolf, to Albert-Frankenthal AG. Delivery device. 4,690,396, Cl. 271-311.000.
Herberg, Helmut, to Siemens Aktiengesellschaft. Monolithically integrated bipolar Darlington circuit. 4,691,221, Cl. 357-46.000.
Hering, Reinhard F. Weather-resistant lignocellulose or other organic or inorganic material boards and process for their production. 4,690,848, Cl. 428-74.000.
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Persbeck, Sven-Erik, 4,690,091, Cl. 114-221.00A.
Herngren, Torbjorn; and Lofthus, Jon, to Svenska Traforskningsinstitutet. Method of measuring dry substance in flue gases. 4,690,634, Cl. 431-8.000.
Herren, Blair: *See*—
Van Alstine, James M.; Harris, J. Milton; Shafer, Steve; Snyder, Robert S.; and Herren, Blair, 4,690,749, Cl. 204-299.00R.
Hershberger, Doran D., to General Electric Company. Laundry machine drive. 4,689,973, Cl. 68-23.700.
Hershman, Arnold: *See*—
Paulik, Frank E.; Hershman, Arnold; Knox, Walter R.; and Roth, James F., 4,690,912, Cl. 502-161.000.
Hess, Stanley R., to Cordis Corporation. Surface mapping electrode sets. 4,690,148, Cl. 128-639.000.
Hess, Stanley R., to Cordis Corporation. Monophasic action potential recording lead. 4,690,155, Cl. 128-786.000.
Hesse, Wolfgang; Settelmeyer, Richard; and Teschner, Eckart, to Hoechst Aktiengesellschaft. Synthetic resin binders and their use for the manufacture of abrasives. 4,690,692, Cl. 51-293.000.
Hetherington, Robert D.: *See*—
Cavanaugh, James E.; Erwin, Larry; and Hetherington, Robert D., 4,690,308, Cl. 222-156.000.
Hetterich, Hermann: *See*—
Olschewski, Armin; Hetterich, Hermann; Horling, Peter; and Stolz, Robert, 4,689,982, Cl. 72-334.000.
Heule, Heinrich. De-burring tool for the de-burring of the edges of holes in curved or oblique surfaces of a work piece. 4,690,595, Cl. 409-143.000.
Hewitt, Lori R.: *See*—
Magee, Charles W.; and Hewitt, Lori R., 4,691,109, Cl. 250-426.000.
Hewlett-Packard Company: *See*—
Leonard, Mark G., 4,691,101, Cl. 250-231.0SE.
Heyden, Eugene L. Marking system for tube placement. 4,690,138, Cl. 128-207.150.
Heyl & Patterson, Inc.: *See*—
Graner, Joseph R., 4,690,603, Cl. 414-372.000.
Heyman, Duane A.: *See*—
Ramlow, Gerhard G.; Heyman, Duane A.; and Grace, Oscar M., 4,690,956, Cl. 521-137.000.
Hibino, Mitsugu; Kanada, Taira; and Hirata, Miyoshi, to Daiichi Pure Chemicals Co., Ltd. Capillary tube immunoassay. 4,690,907, Cl. 436-514.000.
Hickok, William K., to Eastman Kodak Company. Method and apparatus for combining two color video signals. 4,691,245, Cl. 358-310.000.
Hideshima, Yasuhiro: *See*—
Kanno, Masayoshi; Hideshima, Yasuhiro; Tsurumaru, Shinobu; and Kanayama, Ikuo, 4,691,236, Cl. 358-181.000.
Hiebl, Berthold: *See*—
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Higashimoto Kikai Co., Ltd.: *See*—
Higashimoto, Tsuyoshi, 4,690,336, Cl. 241-30.000.
Higashimoto, Tsuyoshi, to Higashimoto Kikai Co., Ltd. Apparatus and method for driving raw sausage meat processing cutter. 4,690,336, Cl. 241-30.000.
Higashiyama, Kazuhiro, to Nissan Motor Company Limited. Spark control system for an engine. 4,690,124, Cl. 123-643.000.
Higgins, Maureen L., to Procter & Gamble Company, The. Adhesive attachment means for absorbent articles. 4,690,680, Cl. 604-386.000.
Hildebrandt, Donald W.: *See*—
Grothaus, Roger H.; and Hildebrandt, Donald W., 4,689,915, Cl. 43-112.000.
Hill, James D., Jr.: *See*—
Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Holloway, Gerald C., Jr.; and Nelson, Jack, 4,690,665, Cl. 474-245.000.
Hilti Aktiegesellschaft: *See*—
Herb, Armin, 4,690,598, Cl. 411-40.000.

Hines, Robin H.; Glasscock, Michael R.; and Johnson, D. Bruce, to Quantime, Inc. Musical entertainment board game. 4,690,025, Cl. 84-1.180.
Hinson, Virgil H.: *See*—
Jarman, Davis R.; and Hinson, Virgil H., 4,690,378, Cl. 254-8.00B.
Hinz, Relf. Oral vestibule plate for prophylactic purposes and early orthodontic treatment. 4,690,640, Cl. 433-6.000.
Hiramoto, Kazuo, to Hitachi, Ltd. Radar apparatus. 4,691,204, Cl. 342-22.000.
Hirano, Yasuo: *See*—
Nishiyama, Masao; and Hirano, Yasuo, 4,691,004, Cl. 528-323.000.
Hiraoka, Hiroyuki; Labadie, Jeffrey W.; Lee, James H.; MacDonald, Scott A.; and Willson, Carlton G., to International Business Machines Corporation. Process for enhancing the resistance of a resist image to reactive ion etching and to thermal flow. 4,690,838, Cl. 427-343.000.
Hirashima, Isao: *See*—
Sakamoto, Toshinori; Hirashima, Isao; and Tsuji, Seiichi, 4,690,432, Cl. 280-775.000.
Hirata, Miyoshi: *See*—
Hibino, Mitsugu; Kanada, Taira; and Hirata, Miyoshi, 4,690,907, Cl. 436-514.000.
Hirata, Yasushi; Kondo, Hitoshi; Yokoyama, Goro; and Ohara, Masaki, to Bridgestone Corporation. Rubber compositions having improved reinforcing properties and low heat build-up. 4,690,965, Cl. 524-236.000.
Hirose, Takao; and Kumekawa, Norio, to Daiichi Denshi Kogyo Kabushiki Kaisha. Ferrule holding device for optical fiber connector. 4,690,494, Cl. 350-96.200.
Hirth, Michael, to BBC Brown, Boveri & Company, Limited. Ozone generator. 4,690,803, Cl. 422-186.180.
Hisatake, Michio: *See*—
Eguchi, Yasukata; Hara, Kazumasa; and Hisatake, Michio, 4,690,082, Cl. 112-254.000.
Hise, Mason R.; and Hise, Neil R. Impact crusher rotating impeller table. 4,690,341, Cl. 241-275.000.
Hise, Neil R.: *See*—
Hise, Mason R.; and Hise, Neil R., 4,690,341, Cl. 241-275.000.
Hitachi Cable, Ltd.: *See*—
Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Oizumi, Kiyoshi, 4,690,211, Cl. 165-177.000.
Hitachi Chemical Co., Ltd.: *See*—
Nakada, Takao, 4,690,911, Cl. 501-105.000.
Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, 4,690,999, Cl. 528-188.000.
Hitachi Engineering and Service Co., Ltd.: *See*—
Onoda, Yoshimitsu; and Goko, Hiroshi, 4,690,251, Cl. 187-107.000.
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hirosi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio. Nuclear fusion reactor. 4,690,793, Cl. 376-136.000.
Hitachi, Ltd.: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,691,298, Cl. 365-189.000.
Hiramoto, Kazuo, 4,691,204, Cl. 342-22.000.
Hori, Ryoichi; and Itoh, Kiyoo, 4,691,304, Cl. 365-226.000.
Houkita, Atsushi; and Hokari, Tomio, 4,689,959, Cl. 60-602.000.
Kita, Toshiaki; and Harada, Tatsuo, 4,690,506, Cl. 350-320.000.
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Miura, Kuniaki; Okada, Yoshinori; Fukushima, Isao; and Otsuka, Susumu, 4,691,246, Cl. 358-310.000.
Murakami, Gen; and Gappa, Takeshi, 4,691,225, Cl. 357-80.000.
Murakami, Susumu; Kagami, Teruyuki; Yatsuo, Tsutomu; and Takahashi, Masaaki, 4,691,223, Cl. 357-51.000.
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.
Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, 4,690,999, Cl. 528-188.000.
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.
Onoda, Yoshimitsu; and Goko, Hiroshi, 4,690,251, Cl. 187-107.000.
Onodera, Katsushige, 4,690,794, Cl. 376-230.000.
Sato, Masahiko; Kato, Kazutoshi; Ishibashi, Akira; and Matsushita, Tsurumasa, 4,691,154, Cl. 318-696.000.
Sugiyama, Shuji; Syohda, Shuji; and Kuniyoshi, Shinji, 4,690,529, Cl. 353-122.000.
Ueno, Tatsuaki; and Inoue, Hajime, 4,691,217, Cl. 357-23.130.
Hitachi Maxell, Ltd.: *See*—
Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,690,864, Cl. 428-336.000.
Hitachi Microcomputer Engineering Ltd.: *See*—
Ueno, Tatsuaki; and Inoue, Hajime, 4,691,217, Cl. 357-23.130.
Hite, John D. Solder dispenser. 4,690,318, Cl. 228-57.000.
Hlbearov, Vladimir P.: *See*—
Garlanov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.
Hochberg, Charles. Birth control pill dispenser in the form of a hair brush. 4,690,279, Cl. 206-531.000.
Hochkonig, Manfred: *See*—
Reichel, Anton; Lohmann, Bernard; Kolb, Eugen; Hochkonig, Manfred; Burst, Hermann; and Kretschmer, Helmut, 4,690,204, Cl. 165-44.000.
Hodges, Philip R. Masonry construction device. 4,689,931, Cl. 52-442.000.
Hodges, Robert J.: *See*—
Greenwood, John C.; Hodges, Robert J.; and Sheppard, Robert, 4,691,117, Cl. 307-119.000.
Hoeberechts, Arthur M. E., to U.S. Philips Corporation. Device for signal processing and target plate for such a device. 4,691,191, Cl. 340-347.00P.
Hoechst Aktiengeselischaft: *See*—
Gunther, Dieter, 4,691,056, Cl. 564-96.000.
Henning, Rainer; and Urbach, Hansjorg, 4,691,022, Cl. 548-408.000.
Hesse, Wolfgang; Settelmeyer, Richard; and Teschner, Eckart, 4,690,692, Cl. 51-293.000.
Uhmann, Rainer; and Radscheit, Kurt, 4,691,008, Cl. 530-339.000.
Hoenigman, Thomas A.: *See*—
Vadakin, Thomas C.; and Hoenigman, Thomas A., 4,690,159, Cl. 134-167.00C.
Hoernle, Hans R.: *See*—
Porter, Rick A.; and Hoernle, Hans R., 4,690,859, Cl. 428-251.000.
Hofbauer, Peter; and Sandhagen, Jurgen, to Volkswagen Aktiengesellschaft. Device for continuous fuel injection. 4,690,118, Cl. 123-533.000.
Hoffman, David C.: *See*—
Matouk, Anthony F.; Hoffman, David C.; and Barrus, Donald M., 4,691,274, Cl. 363-141.000.
Hoffman, Dwight K.; Stevens, Michael G.; and Messick, Virginia B., to Dow Chemical Company, The. Polymer-modified vinylized epoxy resins. 4,690,988, Cl. 525-502.000.
Hoffmann, Daniel J., to Gossen Corporation. Integral composite profile of cellular and non-cellular resins and a dual extrusion method for its manufacture. 4,690,862, Cl. 428-318.600.
Hoffmann-La Roche Inc.: *See*—
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,691,040, Cl. 558-44.000.
Furst, Andor; Labler, Ludwig; and Meier, Werner, 4,691,032, Cl. 549-450.000.
Hofler, Siegfried; Rode, Konrad; and Schmidt, Reinhard, to WABCO Westinghouse Fahrzeugbremsen GmbH. Apparatus for the acquisition of speed-of-rotation and/or angle of rotation signals on a drive shaft. 4,689,990, Cl. 73-118.100.
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, to Schmalbach-Lubeca AG. Opening means for oblong cans. 4,690,297, Cl. 220-273.000.
Hogan, Lawrence R., to Cole-Parmer Instrument Company. Dispensing system with slidable modules. 4,690,307, Cl. 222-95.000.
Hogberg, Leif, to Jydsk Teknologisk Institut. Apparatus for individually depositing articles. 4,690,301, Cl. 221-2.000.
Hokari, Tomio: *See*—
Houkita, Atsushi; and Hokari, Tomio, 4,689,959, Cl. 60-602.000.
Holbrook, Gerald W.: *See*—
Killop, James T.; and Holbrook, Gerald W., 4,689,980, Cl. 72-88.000.
Holdridge, Warren B. Hydraulic nosepiece assembly for a collet closer, and method. 4,690,415, Cl. 279-4.000.
Hollaway, Gerald C., Jr.: *See*—
Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Hollaway, Gerald C., Jr.; and Nelson, Jack, 4,690,665, Cl. 474-245.000.
Holloway, Thomas C.: *See*—
Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; Holloway, Thomas C.; and Bell, David A., 4,690,730, Cl. 156-643.000.
Holloway, Thomas F.: *See*—
Idec, Eric J.; and Holloway, Thomas F., 4,690,578, Cl. 401-78.000.
Hollyday, Robert D.; and Yeager, Patrick F., to AMP Incorporated. Filtered electrical header assembly. 4,690,479, Cl. 439-97.000.
Holm, Niels E., to Danagraf A/S. Method and apparatus for the control of a reproduction camera. 4,690,548, Cl. 355-77.000.
Holman, Stuart: *See*—
Knight, David J.; Scopes, David I. C.; Storer, Richard; and Holman, Stuart, 4,690,917, Cl. 514-23.000.
Holman, Tommy E. Rotating child's seat. 4,690,449, Cl. 296-65.00R.
Holmberg, Dick L. Erosion control foundation mat and method. 4,690,585, Cl. 405-19.000.
Homebodies, Inc.: *See*—
Greenberger, Susan; and Horwich, Kate B., 4,689,831, Cl. 2-93.000.
Honda Giken Kogayo Kabushiki Kaisha: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Shiina, Takanori; Matsumoto, Yukihiro; and Muroya, Minoru, 4,690,121, Cl. 123-589.000.
Kimura, Shigehiro; Ono, Takashi; and Narisawa, Nobuyuki, 4,690,123, Cl. 123-612.000.
Kubo, Kanji, 4,690,425, Cl. 280-668.000.
Kubo, Kanji; Asanuma, Nobuyoshi; Saito, Kazuo; and Yamamoto, Yasuhiko, 4,690,426, Cl. 280-690.000.
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Miyakoshi, Shinichi, 4,690,235, Cl. 180-210.000.
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Shinozaki, Takashi; and Ishikawa, Satoshi, 4,690,236, Cl. 180-219.000.

Honda, Haruyoshi: *See*—
Sato, Susumu; Honda, Haruyoshi; Koumoto, Teruo; Isomae, Kazuo; Kuraishi, Tadayuki; and Katori, Tatsuhiko, 4,690,924, Cl. 514-237.000.

Honeycutt, Fred L., Jr.: *See*—
Robinson, Ronald L.; and Honeycutt, Fred L., Jr., 4,690,330, Cl. 239-265.390.

Honeywell Inc.: *See*—
Huffnagle, Norman P., 4,691,105, Cl. 250-338.000.
Kasprzyk, Donald J., 4,690,324, Cl. 237-8.00R.

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Honn, Kenneth V.: *See*—
Taylor, John D.; and Honn, Kenneth V., 4,690,935, Cl. 514-356.000.

Hoof Products Co.: *See*—
Conlogue, James H.; and Banker, Henry, 4,690,115, Cl. 123-366.000.

Hook, Christopher D.: *See*—
Denne, Phillip R. M.; and Hook, Christopher D., 4,691,202, Cl. 340-825.540.

Horenkamp, Franz, to Ferdinand Lusch GmbH & Co. KG. Height-adjustable fitting for furniture. 4,690,358, Cl. 248-297.300.

Hori, Keiichi: *See*—
Akatsu, Makoto; and Hori, Keiichi, 4,690,618, Cl. 417-226.000.

Hori, Ryoichi; and Itoh, Kiyoo, to Hitachi, Ltd. Semiconductor device having an arrangement for preventing operational errors. 4,691,304, Cl. 365-226.000.

Horikawa, Yoichi, to Yoshida Kogyo K. K. Injection molding machine for small-sized articles. 4,690,629, Cl. 425-156.000.

Horling, Peter: *See*—
Olschewski, Armin; Hetterich, Hermann; Horling, Peter; and Stolz, Robert, 4,689,982, Cl. 72-334.000.

Hornagold, John T.; and Pezewski, Paul, to Simen Aerials, Inc. Articulated work platform with scissors motion. 4,690,246, Cl. 182-2.000.

Horne, David; and Parker, Laurence, to BICC Public Limited Company. Enclosure for housing circuit boards. 4,690,286, Cl. 211-41.000.

Hornung, Ernst; and Rex, Dietrich, to ERNO Raumfahrttechnik Gmbh. Solar energy collector. 4,690,355, Cl. 244-173.000.

Horwich, Kate B.: *See*—
Greenberger, Susan; and Horwich, Kate B., 4,689,831, Cl. 2-93.000.

Hosaka, Shuroku; and Shiga, Masaaki, to Mitsubishi Denki Kabushiki Kaisha. Tunnel erase magnetic head assembly. 4,691,260, Cl. 360-121.000.

Hoshal, Dale E., to Luma Guard, Inc. Reflectorized splash guard. 4,690,419, Cl. 280-154.50R.

Hoshino, Shigeo: *See*—
Laitinen, Herbert A.; and Hoshino, Shigeo, 4,690,735, Cl. 204-37.100.

Hosoi, Hideki; Hasegawa, Toshihiko; and Aoyama, Taizo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Vinyl chloride polymer composition. 4,690,977, Cl. 525-83.000.

Hou, Ching-Tsang; and Barnabe, Nancy P., to Exxon Research and Engineering Company. Method and the microorganism and enzyme used therein for degrading the xanthan molecule. 4,690,891, Cl. 435-42.000.

Houkita, Atsushi; and Hokari, Tomio, to Hitachi, Ltd. Variable-capacity turbocharger. 4,689,959, Cl. 60-602.000.

House Food Industrial Co., Ltd.: *See*—
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,690,699, Cl. 55-267.000.

Howard, William J. Magazine charger. 4,689,909, Cl. 42-87.000.

Howe, James A.: *See*—
Splett, Katherine A.; and Howe, James A., 4,691,126, Cl. 307-441.000.

Howeth, D. Franklin. Pressure dependent dust control filter compressed air reversed flushing control system. 4,690,166, Cl. 137-119.000.

Howeth, D. Franklin. Backflushed air filters with quick opening multiple discharge valve. 4,690,700, Cl. 55-302.000.

Hoyle, Edgar. Clutch control cable with auto-adjuster. 4,690,262, Cl. 192-111.00A.

Hrutfiord, Bjorn F.: *See*—
Fung, Bill S. K.; and Hrutfiord, Bjorn F., 4,691,061, Cl. 568-432.000.

Hsiung, Chia Y.; and Ross, Daniel P., to General Electric Company. Adaptive carrier tracking circuit. 4,691,176, Cl. 331-2.000.

Hubbard, Lloyd C.; and Clausen, Earl W., to Minnesota Minning and Manufacturing Company. Doppler system for measurement of blood flow during cardiopulmonary bypass and ventricular assist. 4,690,002, Cl. 73-861.250.

Huber, Robert: *See*—
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.0SC.

Huber, Thomas, to Electro-Pneumatic-International GmbH. Ball unit. 4,689,847, Cl. 16-26.000.

Hubner Gummi-und Kunststoff GmbH: *See*—
Schmidt, Helmbrecht; Koch, Robert; and Seyer, Richard, 4,690,421, Cl. 280-403.000.

Hufenus, Jean. Variable balance racket. 4,690,406, Cl. 273-73.00J.

Huff, Joel R.; Vacca, Joseph P.; and Baldwin, John J., to Merck & Co., Inc. Substituted hexahydro arylquinolizines as α_2 blockers. 4,690,928, Cl. 514-285.000.

Huffman, Joseph L., to Dresser Industries, Inc. Adjuster for thrust washer wear. 4,690,573, Cl. 384-251.000.

Huffnagle, Norman P., to Honeywell Inc. Thermal energy proximity detector. 4,691,105, Cl. 250-338.000.

Hughes Aircraft Company: *See*—
Ahrens, Allan F.; and Martinelli, Robert M., 4,691,159, Cl. 323-222.000.
Ellerbroek, Brent L., 4,690,555, Cl. 356-121.000.
Gee, Caroline M.; and Thurmond, Gary D., 4,690,488, Cl. 350-96.120.
Ledebuhr, Arno G., 4,690,526, Cl. 353-31.000.
Mollett, Larry R.; and Goczalk, Robert W., 4,691,173, Cl. 330-144.000.
Wong, Mon N.; and Peebles, Ann L., 4,691,177, Cl. 333-113.000.

Hughes, Brett A.; Gilbert, David L.; and Ellerbrock, Eugene A., to Aeroquip Corporation. Beadlock wrench float fitting. 4,689,868, Cl. 29-523.000.

Hughes, Gary: *See*—
Schad, Robert D.; Rees, Herbert; Hughes, Gary; and Murchie, John R., 4,690,633, Cl. 425-526.000.

Hughes, Nathaniel. Single inlet prepackaged inhaler. 4,690,332, Cl. 239-338.000.

Hugues, Francois; Commereuc, Dominique; and Chauvin, Yves, to Institut Francais du Petrole. Process for reducing carbonylation of aldehydes, uses as hemiacetalesters, catalyzed by cobalt carbonyl complexes. 4,691,048, Cl. 560-240.000.

Huhndorff, Harry R.; and Myers, John P., to Eveready Battery Company. Cell circuit interrupter. 4,690,879, Cl. 429-61.000.

Huizer, Cornelis M., to U.S. Philips Corporation. Adaptive electronic buffer system having consistent operating characteristics. 4,691,127, Cl. 307-475.000.

Hull, A. Katherine, to Gach, Paul. Foil for stained glass assembly. 4,690,852, Cl. 428-156.000.

Huls Aktiengesellschaft: *See*—
Jadamus, Hans; Ribbing, Wilfried; and Feinauer, Roland, 4,690,978, Cl. 525-152.000.

Humes, Dennis W.: *See*—
Daghe, Joseph L.; Humes, Dennis W.; Stanley, Mervin D.; and Bouc, Gary L., 4,690,019, Cl. 81-99.000.

Humpleman, Richard J., to International Computers Limited. Clock-/data synchronization interface apparatus and method. 4,691,294, Cl. 364-900.000.

Hunt, Barbara A., executrix: *See*—
Hunt, Charles d'A., deceased, 4,690,875, Cl. 428-577.000.

Hunt, Charles d'A., deceased (by Hunt, Barbara A., executrix), to Degussa Electronics Inc., Materials Division. High vacuum cast ingots. 4,690,875, Cl. 428-577.000.

Huron Manufacturing Corporation: *See*—
Rink, Richard H., 4,690,461, Cl. 299-39.000.

Huruta, Tadashi: *See*—
Utsunomiya, Shunji; Teramoto, Tsutomu; and Huruta, Tadashi, 4,690,151, Cl. 128-682.000.

Huschelrath, Gerhard, to Nukem GmbH. Method and device for testing electrically conducting objects by means of ultra-sonics. 4,689,996, Cl. 73-643.000.

Husky Injection Molding Systems Ltd.: *See*—
Schad, Robert D.; Rees, Herbert; Hughes, Gary; and Murchie, John R., 4,690,633, Cl. 425-526.000.

Hycner, Stanley H.: *See*—
Fadner, Thomas A.; Harenza, Edward R.; Hycner, Stanley H.; and Robinson, Nelson M., 4,690,055, Cl. 101-451.000.

Hydeman, Jeffrey E.: *See*—
Savinell, Alan; and Hydeman, Jeffrey E., 4,689,994, Cl. 73-634.000.

Hyder, Lonnie E.: *See*—
Alexander, Garold W.; Hyder, Lonnie E.; and Wright, Robert V., 4,690,666, Cl. 493-152.000.

Hydro-Quebec: *See*—
Gauthier, Michel; and Fauteux, Denis, 4,690,840, Cl. 427-436.000.

Hydrotile Machinery Company: *See*—
Haddy, Michael L., 4,690,631, Cl. 425-262.000.

Hyun, Choi J.; Chul, Lee J.; and Bum, Choi W., to Daewoo Heavy Industries Ltd. Apparatus for determining reflectivity of an object such as a mirror. 4,691,106, Cl. 250-349.000.

Iba, Kunio: *See*—
Fukamizu, Hiroshi; Nakano, Masaji; Iba, Kunio; Yamasaki, Taro; and Sano, Kenji, 4,690,553, Cl. 356-51.000.

Ibrahim, Ibrahim N.; and Sansome, Dennis H., to National Research Development Corporation. Draw-bending method. 4,689,981, Cl. 72-150.000.

Ichikawa, Toshihito, to Pioneer Electronic Corporation. AM/FM synchronizing circuit. 4,691,356, Cl. 381-4.000.

Ichimura, Hiroshi: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; and Kuriyama, Takashi, 4,691,227, Cl. 358-47.000.

Ichioka, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Elevator control apparatus. 4,690,243, Cl. 187-101.000.

ICI Americas Inc.: *See*—
Davis, Ronald I.; Phalangas, Charalambos J.; and Titus, George R., 4,690,817, Cl. 424-70.000.
Dutta, Anand S.; Stein, Ross L.; Trainor, Diane A.; and Wildonger, Richard A., 4,691,007, Cl. 530-331.000.
Nelson, Richard V.; and Stephen, John F., 4,690,963, Cl. 524-98.000.

Ida, Shuichiro: *See—*
Nagano, Shuji; Ida, Shuichiro; Yoshinaka, Toshio; and Okuda, Shozo, 4,690,015, Cl. 74-665.0GE.

Ide, Akifumi: *See—*
Juri, Tatsuro; Iketani, Akira; Yamamitsu, Chojuro; and Ide, Akifumi, 4,691,329, Cl. 375-122.000.

Ideal Industries, Inc.: *See—*
Blaha, William E., 4,691,079, Cl. 174-87.000.

Idec, Eric J.; and Holloway, Thomas F., to Risdon Corporation. Cosmetic container construction. 4,690,578, Cl. 401-78.000.

Ido, Nobuyuki. Apparatus for fine tuning strings of a stringed musical instrument. 4,690,027, Cl. 84-298.000.

Igari, Kozaburo: *See—*
Suzuki, Akimitsu; Awaji, Toshio; and Igari, Kozaburo, 4,690,257, Cl. 192-3.310.

Ihlenburg, Frederick. Reduced torsion resistance athletic shoe sole. 4,689,901, Cl. 36-126.000.

Iida, Katsumi, to Diesel Kiki Kabushiki Kaisha. Automotive air-conditioning system adapted to obviate the influence of insolation during blower start-up. 4,690,203, Cl. 165-25.000.

Iida, Yasuo: *See—*
Tanigaki, Katsumi; and Iida, Yasuo, 4,690,882, Cl. 430-192.000.

Iijima, Nobuo: *See—*
Nagashima, Masayasu; and Iijima, Nobuo, 4,690,591, Cl. 406-88.000.

Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, to Diesel Kiki Co., Ltd. Compressor having pulsating reducing mechanism. 4,690,619, Cl. 417-269.000.

Iizuka, Toshimi; and Kamata, Shigeru, to Canon Kabushiki Kaisha. Lens mounting. 4,690,505, Cl. 350-252.000.

Iizuka, Toshimi: *See—*
Kamata, Shigeru; and Iizuka, Toshimi, 4,690,514, Cl. 350-429.000.

Iizuka, Yoshio: *See—*
Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, 4,691,027, Cl. 549-32.000.

Ikariya, Takao: *See—*
Yoshikawa, Sadao; Saburi, Masahiko; Ikariya, Takao; Ishii, Youichi; and Akutagawa, Susumu, 4,691,037, Cl. 556-18.000.

Ikeda, Ituso: *See—*
Sakai, Yoshihiro; Ikeda, Ituso; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, 4,690,541, Cl. 355-4.000.

Ikeda, Mitsuo: *See—*
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.

Ikeda, Shigeko: *See—*
Inokuti, Yukio; Ikeda, Shigeko; Funahashi, Toshihiko; and Ito, Yo, 4,690,855, Cl. 428-209.000.

Ikegawa, Akihiko: *See—*
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Iketani, Akira: *See—*
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Illerhaus, Roland: *See—*
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Ilsemann, Bernhard: *See—*
von Sivers, Rolf; Havemann, Kim; and Ilsemann, Bernhard, 4,690,238, Cl. 180-248.000.

Imada, Kunihiko: *See—*
Nakamatsu, Toshio; Matsuo, Yoshikazu; Nishikuri, Masao; and Imada, Kunihiko, 4,690,686, Cl. 8-638.000.

Imaiida, Tetsuo: *See—*
Ooe, Akihiko; Imaiida, Tetsuo; Uchida, Teruyoshi; and Kojima, Hirotaka, 4,690,147, Cl. 128-635.000.

Imaizumi, Junichi: *See—*
Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, 4,690,999, Cl. 528-188.000.

Imakoshi, Shigeyoshi; Fukuyama, Munekatsu; Suyama, Hideo; and Souda, Yutaka, to Sony Corporation. Magnetic transducer head utilizing magnetoresistance effect. 4,691,259, Cl. 360-113.000.

Imamura, Kazunori: *See—*
Tanimoto, Akikazu; and Imamura, Kazunori, 4,690,528, Cl. 353-101.000.

Imbert, Louis. Security enclosure having one or more compartments for housing and protecting a windsurfer against theft. 4,690,467, Cl. 312-198.000.

IMED Corporation: *See—*
Bloomquist, Ted C., 4,690,673, Cl. 604-67.000.

Imperial Chemical Industries plc: *See—*
Andrew, Sydney P.; Doy, Ralph J.; and Limbach, Antony P. J., 4,690,690, Cl. 48-214.00A.
Doroszkowski, Andrew; and Skinner, Maurice W., 4,690,837, Cl. 427-314.000.
Dutta, Anand S.; Stein, Ross L.; Trainor, Diane A.; and Wildonger, Richard A., 4,691,007, Cl. 530-331.000.
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Ghini, Mario, 4,690,282, Cl. 206-626.000.

Ina, Toshikazu: *See—*
Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.

Inaba, Shigeru: *See—*
Katsutani, Kazuji; and Inaba, Shigeru, 4,691,181, Cl. 335-128.000.

Inaba, Yutaka; and Ando, Yujiro, to Canon Kabushiki Kaisha. Ion generating device and method of manufacturing same. 4,691,213, Cl. 346-159.000.

Inagaki, Hiromichi. Casings for ham and sausage. 4,690,843, Cl. 428-36.000.

Inagaki, Mitsuo: *See—*
Takeda, Kenji; Inagaki, Mitsuo; Sasaya, Hideaki; and Matsui, Kazuma, 4,690,465, Cl. 303-119.000.

Inagami, Kaoru; and Kikuchi, Noboru, to Calpis Food Industry Co., Ltd., The. Water-dispersible hydrophilic milk protein product. 4,691,011, Cl. 530-832.000.

Incomm Direct Pty. Ltd.: *See—*
Berton, Andrew S., 4,690,410, Cl. 273-299.000.

Indak Manufacturing Corp.: *See—*
Habecker, John W.; and Black, Charles E., III, 4,691,086, Cl. 200-159.00R.

Industrial Holographics, Inc.: *See—*
Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., 4,690,552, Cl. 356-35.500.

Ingersoll-Rand Company: *See—*
Decker, Robert W., 4,690,622, Cl. 417-342.000.

Innovative Research and Development Co.: *See—*
Palmer, Thomas M., 4,690,384, Cl. 256-47.000.

Innovus: *See—*
Bosley, Robert W.; Kirshman, Samson; LeMay, Dan B.; and Renken, Wayne G., 4,690,371, Cl. 251-65.000.

Ino, Yoichi, to Anelva Corporation. Apparatus comprising a double-collector electron multiplier for counting the number of charged particles. 4,691,160, Cl. 324-71.300.

Inokuchi, Hiroo; Saito, Gunji; Seki, Kazuhiko; and Mori, Takehiko, to Ajinomoto Co., Inc. Tetra-substituted fulvalene derivatives. 4,691,028, Cl. 549-36.000.

Inokuti, Yukio; Ikeda, Shigeko; Funahashi, Toshihiko; and Ito, Yo, to Kawasaki Steel Corporation. Substrate for print circuit board, a print circuit board, and method of manufacturing the same. 4,690,855, Cl. 428-209.000.

Inoue, Fumio; Katsuhara, Yutaka; and Okazaki, Koshi, to Central Glass Company, Limited. Process of preparing metachlorobenzotrifluoride. 4,691,066, Cl. 570-144.000.

Inoue, Hajime: *See—*
Ueno, Tatsuaki; and Inoue, Hajime, 4,691,217, Cl. 357-23.130.

Inoue, Kenichi: *See—*
Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,690,864, Cl. 428-336.000.

Inoue, Makoto: *See—*
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.

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Inoue, Masami: *See—*
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Inoue Mtp Kabushiki Kaisha: *See—*
Watanabe, Kenji; Kato, Hiroshi; and Onishi, Katsunori, 4,690,348, Cl. 242-66.000.

Inoue, Naohiko: *See—*
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Tupitsyn, Konstantin K.; Tupitsyn, Sergei K.; Kostylev, Alexandr D.; Kamensky, Veniamin V.; and Chufistov, Sergei A., 4,690,225, Cl. 173-116.000.

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Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.

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Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.

Integrated Environmental Services: *See—*
Gold, Jeffrey W., 4,690,180, Cl. 141-51.000.

Intel Corporation: *See—*
Tsang, Chi-Hwa; Kawamoto, Galen; and Yau, Leopoldo D., 4,690,728, Cl. 156-643.000.

International Business Machines Corp.: *See—*
Church, Mark A., 4,689,877, Cl. 29-603.000.
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,690,962, Cl. 524-94.000.
Clarke, Thomas C.; Lu, Neng H.; Tomkiewicz, Yaffa; and Tong, Ho M., 4,690,836, Cl. 427-299.000.

Donson, William A.; Ellerson, James V.; Hammer, Richard B.; Lafer, William; and Snyder, Keith A., 4,690,833, Cl. 427-96.000.
Ell, Travis E.; and Stephenson, Jeff, 4,691,152, Cl. 318-616.000.
Goth, George R., 4,691,219, Cl. 357-34.000.
Hiraoka, Hiroyuki; Labadie, Jeffrey W.; Lee, James H.; MacDonald, Scott A.; and Willson, Carlton G., 4,690,838, Cl. 427-343.000.
Jambotkar, Chakrapani G.; and Renbeck, Robert B., 4,689,869, Cl. 437-44.000.
Kobayashi, Masashi; Takahashi, Keishi; and Yoneyama, Kimiya, 4,691,258, Cl. 360-97.000.
Kronstadt, Eric P.; Gheewala, Tushar R.; and Gandhi, Sharad P., 4,691,277, Cl. 364-200.000.
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International Computers Limited: *See—*
Humpleman, Richard J., 4,691,294, Cl. 364-900.000.

International Food Equipment Inc.: *See—*
Verkler, Charles E., 4,690,044, Cl. 99-419.000.

International Minerals & Chemical Corp.: *See—*
Lu, Jing-Jong, 4,690,948, Cl. 514-544.000.

International Standard Electric Company: *See—*
Greenwood, John C.; Hodges, Robert J.; and Sheppard, Robert, 4,691,117, Cl. 307-119.000.

Ipeco Europe Limited: *See—*
Ross, Christopher P., 4,690,606, Cl. 414-495.000.

Ishibashi, Akira: *See—*
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Ishibashi, Shozo: *See—*
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Ishibashi, Tokujiro, to Nippon Rubber Co. Ltd. Antistatic shoe. 4,689,900, Cl. 36-103.000.

Ishida, Keiichi: *See—*
Chiba, Yoshinori; Ishida, Keiichi; and Sugiura, Fumio, 4,690,456, Cl. 297-284.000.

Ishida, Tsuyoshi: *See—*
Kizu, Shuji; Ishida, Tsuyoshi; and Nagase, Yasuo, 4,691,100, Cl. 250-223.00R.

Ishidoshiro, Hiroshi: *See—*
Goto, Tokuju; Tanaka, Itsuo; Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,691,137, Cl. 313-30.000.

Ishii, Shinichi: *See—*
Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, 4,690,764, Cl. 210-629.000.

Ishii, Youichi: *See—*
Yoshikawa, Sadao; Saburi, Masahiko; Ikariya, Takao; Ishii, Youichi; and Akutagawa, Susumu, 4,691,037, Cl. 556-18.000.

Ishikawa, Hidenobu: *See—*
Sakakibara, Shigeru; Arimoto, Shunji; Ishikawa, Hidenobu; and Maruyama, Osamu, 4,690,987, Cl. 525-502.000.

Ishikawa, Satoshi: *See—*
Shinozaki, Takashi; and Ishikawa, Satoshi, 4,690,236, Cl. 180-219.000.

Ishikuro, Hiroshi: *See—*
Uemura, Toshinobu; Okhuma, Toshiaki; Shinooka, Kiyohide; Ishikuro, Hiroshi; and Ueda, Yoshio, 4,690,822, Cl. 424-455.000.

Ishiwari, Kazuo: *See—*
Ohmori, Akira; and Ishiwari, Kazuo, 4,690,869, Cl. 428-421.000.

Iskra-Sozd elektrokovinske industrije n.sol.o: *See—*
Kavcic, Janez, 4,691,194, Cl. 340-405.000.

Isliker, Gaston R.: *See—*
Snow, Wayne R.; Isliker, Gaston R.; and Johnson, Colin A., deceased, 4,690,480, Cl. 439-364.000.

Isobe, Toshiaki; and Oba, Hidehiro, to Toyota Jidosha Kabushiki Kaisha. Fuel injection control device for internal combustion engine. 4,690,117, Cl. 123-492.000.

Isomae, Kazuo: *See—*
Sato, Susumu; Honda, Haruyoshi; Koumoto, Teruo; Isomae, Kazuo; Kuraishi, Tadayuki; and Katori, Tatsuhiko, 4,690,924, Cl. 514-237.000.

Israel Aircraft Industries Ltd.: *See—*
Bar-Nefy, Simcha; and Tiomkin, Michael, 4,690,030, Cl. 89-1.130.

Isshiki, Isao: *See—*
Takahashi, Shinichiro; and Isshiki, Isao, 4,691,330, Cl. 377-39.000.

Isuzu Motors Ltd.: *See—*
Shimizu, Yoshiro, 4,689,916, Cl. 49-374.000.

Ito, Bunsaku; Fukuda, Kimio; and Hara, Rikio, to Ube Industries, Inc. Metal polyamide adhesive laminates. 4,690,856, Cl. 428-215.000.

Ito, Hiraku: *See—*
Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, 4,690,973, Cl. 525-54.100.

Ito, Ken; and Inoue, Naohiko, to Nissan Motor Co., Ltd. System for controlling cornering characteristics of wheeled vehicle. 4,690,431, Cl. 280-771.000.

Ito, Masayoshi: *See—*
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.

Ito, Toshinobu: *See—*
Kohno, Kouji; Takubo, Hiroichi; and Ito, Toshinobu, 4,690,111, Cl. 123-192.00B.

Ito, Yo: *See—*
Inokuti, Yukio; Ikeda, Shigeko; Funahashi, Toshihiko; and Ito, Yo, 4,690,855, Cl. 428-209.000.

Ito, Yuji, to Canon Kabushiki Kaisha. Particle analyzing apparatus. 4,690,561, Cl. 356-339.000.

Itoh, Kiyoo: *See—*
Hori, Ryoichi; and Itoh, Kiyoo, 4,691,304, Cl. 365-226.000.

Itoh, Shinichi: *See—*
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hiroshi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio, 4,690,793, Cl. 376-136.000.

Itoh, Takaaki: *See—*
Uranishi, Kouji; and Itoh, Takaaki, 4,690,293, Cl. 220-86.00R.

ITT Electro Optical Products: *See—*
Johnson, C. B., 4,691,099, Cl. 250-213.0VT.

ITT Gilfillan, a division of ITT Corporation: *See—*
Foglesonger, John D.; and Vranson, David M., 4,689,876, Cl. 29-600.000.
Vlasak, Weldon R. H., 4,691,312, Cl. 370-4.000.

Ivarsson, Nemo: *See—*
Appelgren, Curt H.; and Ivarsson, Nemo, 4,690,834, Cl. 427-189.000.

Iwakawa, Yoshihiro: *See—*
Matsuda, Shohei; and Iwakawa, Yoshihiro, 4,690,464, Cl. 303-115.000.

Iwamoto, Yasushi: *See—*
Beppu, Teruhiko; Iwamoto, Yasushi; and Yoshida, Minoru, 4,690,918, Cl. 514-23.000.

Iwasaki, Takashi; Tomita, Yasuo; and Hayashi, Tsunekazu, to Mitsubishi Sangyo Co. Ltd. Method for manufacturing thick asphalt sheet. 4,690,839, Cl. 427-366.000.

Iwata Electric Co., Ltd.: *See—*
Iwata, Keisuke, 4,691,313, Cl. 370-30.000.

Iwata, Hitoshi: *See—*
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,690,699, Cl. 55-267.000.

Iwata, Jun, to NEC Corporation. Data processor executing microprograms according to a plurality of system architectures. 4,691,278, Cl. 364-200.000.

Iwata, Keisuke, to Iwata Electric Co., Ltd. Wireless talking apparatus. 4,691,313, Cl. 370-30.000.

Iwata, Michiyoshi: *See—*
Matsumoto, Kazuyuki; Hashimoto, Mashataka; and Iwata, Michiyoshi, 4,690,010, Cl. 74-469.000.

Iwatsuki, Kunihiro: *See—*
Taniguchi, Hiroji; Iwatsuki, Kunihiro; and Shindou, Yoshio, 4,690,017, Cl. 74-866.000.

Izawa, Hideo: *See—*
Kishine, Toshiaki; Izawa, Hideo; and Ohba, Masaru, 4,690,051, Cl. 101-211.000.

Izumi, Shuji: *See—*
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, 4,690,536, Cl. 354-402.000.

Izumi, Toshio; Saito, Ryozo; Kato, Yoichi; and Miyata, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Control system for three way variable shock absorber device for suspension with highest shock absorber effectiveness not selected in manual mode. 4,691,284, Cl. 364-424.000.

Jackson, Gerald W.; and Rohweder, David S. Wheeled vehicle test fixture connector. 4,689,998, Cl. 73-669.000.

Jackson, Roy K.: *See—*
Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., 4,690,562, Cl. 356-361.000.

Jacob, Keith D., to C-D Marketing, Ltd. Liquid crystal closed-loop controlled mirror systems. 4,690,508, Cl. 350-331.00R.

Jacob, Neil R.: *See—*
Beckley, Keith A.; Jacob, Neil R.; and Trussler, Geoffrey A., 4,689,991, Cl. 73-304.00C.

Jacobs, Jochen: *See—*
Jeschke, Peter; Altenschoepfer, Theodor; Jacobs, Jochen; and Schumann, Klaus, 4,690,770, Cl. 252-99.000.

Jadamus, Hans; Ribbing, Wilfried; and Feinauer, Roland, to Huls Aktiengesellschaft. Thermoplastic compositions based on polyphenylene ethers and styrene-butadiene polymers produced by emulsion polymerization. 4,690,978, Cl. 525-152.000.

Jadamus, Hans: *See—*
Feinauer, Roland; and Jadamus, Hans, 4,690,970, Cl. 524-504.000.

Jaehme, Joachim: *See—*
Ruechardt, Christoph; Jaehme, Joachim; and Salz, Ulrich, 4,691,020, Cl. 546-341.000.

Jahnel, Ernst: *See—*
Peter, Rudolf; Jahnel, Ernst; and Kunz, Hans-Peter, 4,690,261, Cl. 192-87.130.

Jambotkar, Chakrapani G.; and Renbeck, Robert B., to International Business Machines Corporation. Fabrication of insulated gate gallium arsenide FET with self-aligned source/drain and submicron channel length. 4,689,869, Cl. 437-44.000.

Janke, Donald E.; and Linstromberg, William J., to Whirlpool Corporation. Adaptive defrost control for a refrigerator. 4,689,965, Cl. 62-155.000.

Janome Sewing Machine Co Ltd.: *See—*
Eguchi, Yasukata; Hara, Kazumasa; and Hisatake, Michio, 4,690,082, Cl. 112-254.000.

Janome Sewing Machine Co. Ltd.: *See—*
Hara, Kazumasa; Koike, Mikio; and Sasano, Akiyoshi, 4,690,083, Cl. 112-254.000.

Jansen, Gerardus L. M.; Smulders, Henricus J.; and Schuitmaker, Pieter D., to U.S. Philips Corporation. Disc reading apparatus with disc shoot journaled in frame. 4,691,311, Cl. 369-100.000.

Janson, David A.: *See*—
Bopp, Warren G.; and Janson, David A., 4,690,256, Cl. 192-21.000.

Janssen, Petrus J.; and Janssens, Peter C., to U.S. Philips Corp. Glass optical fiber having a primary and a secondary coating. 4,690,503, Cl. 350-96.300.

Janssens, Peter C.: *See*—
Janssen, Petrus J.; and Janssens, Peter C., 4,690,503, Cl. 350-96.300.

Jantzen, Steven L.: *See*—
Billingsley, Robert H.; and Jantzen, Steven L., 4,690,071, Cl. 105-404.000.

Janusz, Edward G., to Sun Chemical Corporation. Polyamide-modified metal resinates and their use in publication gravure printing inks. 4,690,712, Cl. 106-30.000.

Jarman, Davis R.; and Hinson, Virgil H., to Automotive Collision Tools, Inc. Vehicle jack. 4,690,378, Cl. 254-8.00B.

Jarvenkyla , Jyri, to Uponor N.V. Plastic pipe. 4,690,174, Cl. 138-121.000.

Jarvimaki, Kari: *See*—
Tervamaki, Jukka; and Jarvimaki, Kari, 4,690,005, Cl. 73-864.120.

JD-Technologie AG: *See*—
Brandli, Max; and Feldmann, Hansueli, 4,690,422, Cl. 280-460.00R.

Jeindl, Ferdinand, to Steirische Kettenfabriken Pengg-Walenta KG. Securing device for a vehicle tire chain. 4,690,190, Cl. 152-213.00A.

Jelbring, Hans. Arrangement for ensuring that ice will form substantially uniformly on a tubular heat exchanger placed in water. 4,690,205, Cl. 165-45.000.

Jen, Tai-Kuang, to NCR Corporation. Motor speed controller. 4,691,150, Cl. 318-331.000.

Jencks, David R.; and Nelson, Mark R., to Orley's Manufacturing Co., Inc. Catalytic combustion assembly for wood-burning stove. 4,690,126, Cl. 126-77.000.

Jenkins, Leonard S., to Westinghouse Electric Corp. Nuclear reactor coolant pump impeller/shaft assembly. 4,690,612, Cl. 415-112.000.

Jenkinson, Ronald J., to Exxon Research and Engineering Company. Apparatus for controlling the temperature in catalyst regeneration. 4,690,802, Cl. 422-141.000.

Jenoptik Jena GmbH: *See*—
Florek, Stefan; Becker-Ross, Helmut; Dobschal, Hans-Jurgen; and Mohr, Joachim, 4,690,559, Cl. 356-328.000.
Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, 4,691,110, Cl. 250-458.100.

Jensen, Millard J.: *See*—
Levine, Jules D.; Jensen, Millard J.; and Haney, Ronald E., 4,691,076, Cl. 136-250.000.

Jeschke, Peter; Altenschoepfer, Theodor; Jacobs, Jochen; and Schumann, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Block-form detergent free from alkali hydroxides for use in dishwashing machines and a process for its production. 4,690,770, Cl. 252-99.000.

Jeumont-Schneider Corporation: *See*—
Boisdon, Claude, 4,691,325, Cl. 373-108.000.

Jidosha Kiki Co., Ltd.: *See*—
Arino, Masao; and Kobayashi, Michio, 4,689,958, Cl. 60-547.100.
Masuda, Naosuke; and Sunaga, Sohsuke, 4,689,983, Cl. 72-356.000.

Jisova, Vaclava: *See*—
Kolinsky, Miloslav; Jisova, Vaclava; and Babka, Josef, 4,690,989, Cl. 526-88.000.

Jobe, Benjamin L., to Jogler, Inc. Combined shut off and check valve. 4,690,169, Cl. 137-614.160.

Jobe, Tommy L., to Technical Oil Tools Corporation. Intrinsically safe multi-drop communications link. 4,691,384, Cl. 455-602.000.

Jogler, Inc.: *See*—
Jobe, Benjamin L., 4,690,169, Cl. 137-614.160.

Johansson, Lars-Erik, to Flakt AB. Media mixing nozzle assembly. 4,690,333, Cl. 239-434.500.

John D. Hollingsworth On Wheels, Inc.: *See*—
Pinto, Akiva, 4,689,857, Cl. 19-105.000.

John T. Hepburn, Limited: *See*—
Malashenko, Leon, 4,690,049, Cl. 100-214.000.

Johns Hopkins University, The: *See*—
Ko, Harvey W., 4,690,149, Cl. 128-653.000.

Johnson, Barbara F., executor: *See*—
Snow, Wayne R.; Isliker, Gaston R.; and Johnson, Colin A., deceased, 4,690,480, Cl. 439-364.000.

Johnson, C. B., to ITT Electro Optical Products. Secondary cathode microchannel plate tube. 4,691,099, Cl. 250-213.0VT.

Johnson, Colin A., deceased: *See*—
Snow, Wayne R.; Isliker, Gaston R.; and Johnson, Colin A., deceased, 4,690,480, Cl. 439-364.000.

Johnson, D. Bruce: *See*—
Hines, Robin H.; Glasscock, Michael R.; and Johnson, D. Bruce, 4,690,025, Cl. 84-1.180.

Johnson, Gary, to Heil Co., The. Refuse collection truck and apparatus for controlling compaction of refuse. 4,690,607, Cl. 414-517.000.

Johnson, Jay K.: *See*—
Schwartz, Arthur G.; Gurries, Richard M.; and Johnson, Jay K., 4,690,697, Cl. 55-84.000.

Johnson & Johnson: *See*—
Mattingly, William B., III; Cabe, Alex W., Jr.; Chapas, Richard B.; and Sampson, Arthur J., Jr., 4,690,679, Cl. 604-383.000.

Johnson & Johnson Products, Inc.: *See*—
Kammerer, Gene W.; Yoon, Hee K.; and Sun, Robert Li-Jiun, 4,690,842, Cl. 428-35.000.

Johnson, Kenneth M.: *See*—
Leonard, Ronald J.; and Johnson, Kenneth M., 4,690,758, Cl. 210-247.000.

Johnson, Mark R.: *See*—
Keskey, William H.; and Johnson, Mark R., 4,690,995, Cl. 526-286.000.

Johnson, Robert R.: *See*—
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., 4,691,243, Cl. 358-294.000.
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., 4,691,244, Cl. 358-294.000.

Johnson, Robert W., Jr., to Union Camp Corporation. Method of preparing rosin ester from polyol with phosphorous acid catalyst. 4,690,783, Cl. 260-104.000.

Johnson, Timothy W.; Beever, William H.; O'Connor, James E.; and Blackwell, Jennings P., to Phillips Petroleum Company. Method of producing poly(arylene sulfide) compositions and articles made therefrom. 4,690,972, Cl. 524-609.000.

Johnston, Charles F. Valve assembly for a sphygmomanometer. 4,690,171, Cl. 137-877.000.

Johnston, Thomas E.; and Dorer, Casper J., Jr., to Lubrizol Corporation, The. Fuel products comprising a lead scavenger. 4,690,687, Cl. 44-67.000.

Johzuka, Takashi: *See*—
Watanabe, Hiroshi; Johzuka, Takashi; and Suzuki, Masanobu, 4,691,376, Cl. 455-131.000.

Jones, Martin A.: *See*—
Adams, Graham; and Jones, Martin A., 4,690,688, Cl. 44-76.000.

Jones, Robert D. Beverage container. 4,690,294, Cl. 220-90.200.

Jones, Robert E.: *See*—
Shawcross, Alfred L.; Stevens, Donn E.; and Jones, Robert E., 4,690,520, Cl. 350-517.000.

Jordan, Janet M.: *See*—
Croman, Stanley W. T.; Jordan, Janet M.; and Paukovits, Edward J., Jr., 4,690,266, Cl. 198-388.000.

Jorgensen, Ove: *See*—
McCulloch, Robert M.; and Jorgensen, Ove, 4,689,968, Cl. 62-225.000.

Jorgenson, Michael W.: *See*—
Kilgour, John A.; and Jorgenson, Michael W., 4,690,955, Cl. 521-112.000.

Joshita, Yutaka: *See*—
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yuusuke; and Joshita, Yutaka, 4,690,949, Cl. 514-561.000.

Juaire, Phillip R.; Wagner, Frederic M.; and Wildgen, Leo F., to Satellite Industries, Inc. Building wall panel and door unit. 4,689,917, Cl. 49-380.000.

Jukkola, Glen D.: *See*—
Peletz, Lawrence J., Jr.; and Jukkola, Glen D., 4,690,076, Cl. 110-347.000.

Juncosa, Robert D., to American Medscan, Inc. Apparatus for epithelial tissue impedance measurements. 4,690,152, Cl. 128-734.000.

Jung, Adolf: *See*—
Cappel, Bert; Knapp, Karl L.; and Jung, Adolf, 4,690,054, Cl. 101-409.000.

Junino, Alex: *See*—
Grollier, Jean-Francois; Cotteret, Jean; Junino, Alex; and Genet, Alain, 4,690,685, Cl. 8-405.000.

Jurgensen, Bruce A. Expandable structure and sequence of expansion. 4,689,924, Cl. 52-67.000.

Juri, Tatsuro; Iketani, Akira; Yamamitsu, Chojuro; and Ide, Akifumi, to Matsushita Electric Industrial Co., Ltd. Block encoder. 4,691,329, Cl. 375-122.000.

Jydsk Teknologisk Institut: *See*—
Hogberg, Leif, 4,690,301, Cl. 221-2.000.

K-2 Corporation: *See*—
Fezio, Louis J., 4,690,850, Cl. 428-105.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Hashimoto, Yasuyuki, 4,690,660, Cl. 464-68.000.

Kabushiki Kaisha Kito: *See*—
Nakamura, Takayoshi, 4,690,379, Cl. 254-347.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Okamoto, Hiroshi, 4,690,200, Cl. 164-504.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nozue, Yasuhiro; Kajiyama, Koichi; and Sajiki, Kazuaki, 4,691,322, Cl. 372-82.000.

Kabushiki Kaisha Kumalift Gijutsu Kenkyusho: *See*—
Nobuhara, Uichi, 4,690,611, Cl. 414-661.000.

Kabushiki Kaisha Medos Kenkyusho: *See*—
Ouchi, Teruo; and Shibuya, Hiromichi, 4,690,175, Cl. 138-131.000.

Kabushiki Kaisha Meidensha: *See*—
Hashimoto, Takafumi; Kamanaka, Yoshihide; and Ashikaga, Tadashi, 4,691,158, Cl. 320-14.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kokubu, Sadao, 4,691,201, Cl. 340-825.310.

Kabushiki Kaisha Toshiba: *See*—
Haragashira, Motoji, 4,691,164, Cl. 324-322.000.
Hashimoto, Kazuhiko, 4,691,123, Cl. 307-296.00R.
Kinoshita, Tsuneo, 4,691,282, Cl. 364-200.000.
Kizu, Shuji; Ishida, Tsuyoshi; and Nagase, Yasuo, 4,691,100, Cl. 250-223.00R.
Morishita, Mimpei; and Azukizawa, Teruo, 4,690,066, Cl. 104-282.000.
Motegi, Nawoto; Watanabe, Yukio; Shimada, Naohiro; and Okajima, Masaki, 4,691,321, Cl. 372-46.000.

Nonaka, Hikaru, 4,689,966, Cl. 62-187.000.
Ohguma, Hirotsugu; Harada, Mitsuo; Saura, Hideaki; and Yasuda, Satoshi, 4,689,970, Cl. 62-514.00R.
Okui, Isamu; and Onda, Tetsurou, 4,691,235, Cl. 358-172.000.
Sakakibara, Yuichi; Takahashi, Yukio; and Shima, Hideharu, 4,691,140, Cl. 313-486.000.
Suzuki, Soichi; Aihara, Mitsuo; and Fujii, Mitsuo, 4,691,287, Cl. 364-490.000.
Watanabe, Junji, 4,690,543, Cl. 355-4.000.

Kadin, Saul B., to Pfizer Inc. Analgesic and antiinflammatory 1,3-diacyl-2-oxindole compounds. 4,690,943, Cl. 514-418.000.

Kaeriyama, Kyoji: *See*—
Sato, Masaaki; Tanaka, Susumu; Kaeriyama, Kyoji; and Suda, Yoshio, 4,691,005, Cl. 528-380.000.

Kagami, Teruyuki: *See*—
Murakami, Susumu; Kagami, Teruyuki; Yatsuo, Tsutomu; and Takahashi, Masaaki, 4,691,223, Cl. 357-51.000.

Kagatani, Seiya; Hasumi, Shunji; Sonobe, Takashi; and Aruga, Masayoshi, to Yamanouchi Pharmaceutical Co., Inc. Pharmaceutical compositions for nasal administration comprising calcitonin and an absorption-promoting substance. 4,690,952, Cl. 514-808.000.

Kageyama, Shunji: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,690,932, Cl. 514-337.000.

Kageyama, Yoshiteru: *See*—
Narumiya, Yoshikazu; Hashimoto, Yasuo; Yui, Hiroshi; and Kageyama, Yoshiteru, 4,690,778, Cl. 252-506.000.

Kaiho, Shigeo: *See*—
Otsuka, Nobuyuki; Kasuya, Atsuo; Nakayama, Yusho; Kumashiro, Masayuki; Furuya, Tamio; and Kaiho, Shigeo, 4,689,979, Cl. 72-57.000.

Kaisei Kogyo Corporation: *See*—
Fuminao, Tanitomi, 4,690,184, Cl. 144-2.00Z.

Kaiser Aerospace & Electronics Corporation: *See*—
Elliott, Gregory K., 4,690,296, Cl. 220-259.000.

Kaiser, Wolfgang: *See*—
Held-Elbert, Gabriele; Kaiser, Wolfgang; and Schmutzler, Werner, 4,691,337, Cl. 379-24.000.

Kajiyama, Koichi: *See*—
Nozue, Yasuhiro; Kajiyama, Koichi; and Sajiki, Kazuaki, 4,691,322, Cl. 372-82.000.

Kaken Pharmaceutical Co., Ltd.: *See*—
Naito, Takanobu; Yokoyama, Masaaki; Sasaki, Kazuya; Yamamoto, Makoto; and Amemiya, Kouji, 4,691,014, Cl. 540-227.000.

Kallay nee Sohonyai, Anna: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

Kalman Floor Company: *See*—
Kirven, Thomas, 4,689,892, Cl. 33-533.000.

Kamanaka, Yoshihide: *See*—
Hashimoto, Takafumi; Kamanaka, Yoshihide; and Ashikaga, Tadashi, 4,691,158, Cl. 320-14.000.

Kamata, Shigeru; and Iizuka, Toshimi, to Canon Kabushiki Kaisha. Lens moving device. 4,690,514, Cl. 350-429.000.

Kamata, Shigeru: *See*—
Iizuka, Toshimi; and Kamata, Shigeru, 4,690,505, Cl. 350-252.000.

Kambe, Rokuro: *See*—
Kato, Norio; Nozaki, Shunkichi; Kimura, Yukihiro; and Kambe, Rokuro, 4,690,872, Cl. 428-446.000.

Kamensky, Veniamin V.: *See*—
Tupitsyn, Konstantin K.; Tupitsyn, Sergei K.; Kostylev, Alexandr D.; Kamensky, Veniamin V.; and Chufistov, Sergei A., 4,690,225, Cl. 173-116.000.

Kamiguchi, Taiji: *See*—
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, 4,691,053, Cl. 562-531.000.

Kamijyo, Yoshimi, to Alps Electric Co., Ltd. Molybdenum oxide whiskers and a method of producing the same. 4,690,813, Cl. 423-606.000.

Kamiyama, Kouzi, to Fuji Photo Film Co., Ltd. Process for the preparation of ferrite magnetic particulate for magnetic recording. 4,690,768, Cl. 252-62.580.

Kammerer, Gene W.; Yoon, Hee K.; and Sun, Robert Li-Jiun, to Johnson & Johnson Products, Inc. Reinforced casting material. 4,690,842, Cl. 428-35.000.

Kamoshita, Katsuzo: *See*—
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, 4,690,946, Cl. 514-485.000.
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, 4,690,709, Cl. 71-120.000.

Kamoshita, Mutuo: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hiroshi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio, 4,690,793, Cl. 376-136.000.

Kampfer, Konrad: *See*—
Rieger, Wolfhart; Ganckler, Ludwig; Maurer, Albert; and Kampfer, Konrad, 4,690,763, Cl. 210-496.000.

Kanada, Taira: *See*—
Hibino, Mitsugu; Kanada, Taira; and Hirata, Miyoshi, 4,690,907, Cl. 436-514.000.

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Hosoi, Hideki; Hasegawa, Toshihiko; and Aoyama, Taizo, 4,690,977, Cl. 525-83.000.
Yamane, Takehiko; Hashizume, Takuji; Yamashita, Katsuji; and Watanabe, Kiyoshi, 4,690,919, Cl. 514-183.000.

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Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivative of cephalosporanic acid and pharmaceutical composition comprising the same. 4,690,920, Cl. 514-201.000.

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Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,690,923, Cl. 514-222.000.

Kasai, Masaji: *See*—
Shirahata, Kunikatsu; Kono, Motomichi; Saito, Yutaka; Kasai, Masaji; Morimoto, Makoto; and Ashizawa, Tadashi, 4,691,024, Cl. 548-422.000.

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Takai, Kiyoshi; and Kaseya, Akinori, 4,690,327, Cl. 239-226.000.

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F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.

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Tomibe, Shinji; Gomibuchi, Reizo; Takahashi, Kiyofumi; and Kato, Noboru, 4,690,854, Cl. 428-195.000.

Kato, Norio; Nozaki, Shunkichi; Kimura, Yukihiro; and Kambe, Rokuro, to NGK Spark Plug Co., Ltd. Ceramic heater. 4,690,872, Cl. 428-446.000.

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Izumi, Toshio; Saito, Ryozo; Kato, Yoichi; and Miyata, Hiroshi, 4,691,284, Cl. 364-424.000.

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Katz, William. Intravenous needle assembly. 4,690,675, Cl. 604-177.000.

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Dahlquist, Håkan; and Kaufmann, Herbert, 4,690,012, Cl. 74-479.000.

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Kawaguchi, Hisao: *See*—
Takamatsu, Toshiaki; Kuwagaki, Hiroshi; Minezaki, Shigehiro; Yamamoto, Kunihiko; Nakatani, Hiroshi; and Kawaguchi, Hisao, 4,690,510, Cl. 350-334.000.

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Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.

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Tsang, Chi-Hwa; Kawamoto, Galen; and Yau, Leopoldo D., 4,690,728, Cl. 156-643.000.

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Narutani, Tetsu; and Suzuki, Shigeharu, 4,690,798, Cl. 420-61.000.
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Tanji, Hiroaki; Suzuki, Masaharu; Nomura, Kenji; Watanabe, Shojiro; and Kawasaki, Takashi, 4,690,841, Cl. 428-35.000.

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Kosaka, Masato; and Yamazaki, Tatsu, 4,690,036, Cl. 91-506.000.

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Wakabayashi, Hiroshi; and Kazami, Kazuyuki, 4,690,533, Cl. 354-173.110.

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Sanderson, John R.; Smith, William A.; Marquis, Edward T.; and Keating, Kenneth P., 4,691,034, Cl. 549-542.000.
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Taylor, John E.; and Keene, Ian W., 4,690,499, Cl. 350-96.230.

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Loiacono, Joseph, 4,690,523, Cl. 351-129.000.

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Friedman, Walter; and Stricker, David J., 4,690,656, Cl. 446-95.000.

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Urata, Toshimitsu, 4,690,006, Cl. 73-866.500.

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Betts, David R.; and Edmonds, Michael G., 4,690,417, Cl. 280-42.000.

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Rockenschaub, Walter; and Kepplinger, Werner, 4,690,387, Cl. 266-144.000.

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Blass, Judd; and Keren, Hanan, 4,691,163, Cl. 324-318.000.

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Khu, Arthur H., to Advanced Micro Devices, Inc. Methods and apparatus for encoding and decoding data to and from a (2,7) format. 4,691,193, Cl. 340-347.0DD.

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Takeda, Kyoji; and Kitai, Akira, 4,690,346, Cl. 242-56.00R.

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Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, 4,691,027, Cl. 549-32.000.

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Beele, Gunther, 4,690,385, Cl. 266-44.000.

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Kobayashi, Michio: *See*—
Arino, Masao; and Kobayashi, Michio, 4,689,958, Cl. 60-547.100.

Kobayashi, Ryuichi: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,690,532, Cl. 354-173.110.

Koch, Robert: *See*—
Schmidt, Helmbrecht; Koch, Robert; and Seyer, Richard, 4,690,421, Cl. 280-403.000.

Koch, William R.: *See*—
Sircar, Shivaji; and Koch, William R., 4,690,696, Cl. 55-26.000.

Koda, Akio: *See*—
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.

Kodaira, Kazuhiko: *See*—
Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, 4,690,973, Cl. 525-54.100.

Koga, Yoshihiro: *See*—
Tosa, Takafumi; Koga, Yoshihiro; and Matsuishi, Tsutomu, 4,691,054, Cl. 562-554.000.

Kogure, Osamu: *See*—
Fukuda, Mitsutoshi; Fukutomi, Makoto; Kogure, Osamu; and Miyoshi, Kazunori, 4,690,887, Cl. 430-331.000.

Kohama, Tokio: *See*—
Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.

Kohara, Yuritoshi: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.

Kohler, Klaus: *See*—
Andrade, Juan; Prescher, Gunter; and Kohler, Klaus, 4,691,062, Cl. 568-495.000.

Kohno, Kouji; Takubo, Hiroichi; and Ito, Toshinobu, to Mazda Motor Corporation. Bearing arrangements for balancing shafts of internal combustion engines. 4,690,111, Cl. 123-192.00B.

Koike, Kengo: *See*—
Yoshida, Hiroshi; Konishi, Kenji; Koike, Kengo; Nakagawa, Taizo; Shimano, Shizuo; and Mochizuki, Seiji, 4,690,934, Cl. 514-354.000.

Koike, Mikio: *See*—
Hara, Kazumasa; Koike, Mikio; and Sasano, Akiyoshi, 4,690,083, Cl. 112-254.000.

Koizumi, Yutaka: *See*—
Furuta, Hideya; Koizumi, Yutaka; Mamizuka, Mitsuru; and Sakai, Yoshihiro, 4,690,542, Cl. 355-4.000.

Kojima, Hirotaka: *See*—
Ooe, Akihiko; Imaiida, Tetsuo; Uchida, Teruyoshi; and Kojima, Hirotaka, 4,690,147, Cl. 128-635.000.

Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, to Yamanouchi Pharmaceutical Co., Ltd. Coumarins with imidazolyl group or pyridyloxy group having plateletes aggregation inhibiting activity. 4,690,932, Cl. 514-337.000.
Koken Company Limited: *See*—
Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, 4,690,973, Cl. 525-54.100.
Kokubu, Sadao, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Encoded signal device with self-contained clock generation. 4,691,201, Cl. 340-825.310.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Kaneko, Masahide; Hatori, Yoshinori; and Miyasato, Tsutomu, 4,691,230, Cl. 358-105.000.
Kolb, Eugen: *See*—
Reichel, Anton; Lohmann, Bernard; Kolb, Eugen; Hochkonig, Manfred; Burst, Hermann; and Kretschmer, Helmut, 4,690,204, Cl. 165-44.000.
Kolinsky, Miloslav; Jisova, Vaclava; and Babka, Josef, to Ceskoslovenska akademie ved. Method for the single-step production of vinyl polymers. 4,690,989, Cl. 526-88.000.
Kolk, Erich: *See*—
Schick, Hans; Kolk, Erich; Fauth, Karl-Heinz; and Mohr, Heinrich, 4,691,072, Cl. 585-525.000.
Komai, Kensaku: *See*—
Matsuda, Kumehiko; and Komai, Kensaku, 4,691,283, Cl. 364-405.000.
Komamura, Chiaki: *See*—
Ninomiya, Yasuo; Komamura, Chiaki; and Musa, Yoshikazu, 4,690,786, Cl. 264-4.600.
Komanduri, Ranga, to General Electric Company. Polycrystalline diamond and CBN cutting tools. 4,690,691, Cl. 51-293.000.
Kondo, Hiroshi, to Toko, Inc. Pulse delay circuit device. 4,691,120, Cl. 307-265.000.
Kondo, Hitoshi: *See*—
Hirata, Yasushi; Kondo, Hitoshi; Yokoyama, Goro; and Ohara, Masaki, 4,690,965, Cl. 524-236.000.
Kondo, Tetsuo: *See*—
Umemoto, Yonetsugu; Shirasawa, Hiroshi; Ogo, Muneya; Kinoshita, Kazumasa; and Kondo, Tetsuo, 4,690,581, Cl. 403-133.000.
Kone Oy: *See*—
Kimmo, Kayhko; and Helenius, Kari H., 4,690,900, Cl. 436-47.000.
Konishi, Kenji: *See*—
Yoshida, Hiroshi; Konishi, Kenji; Koike, Kengo; Nakagawa, Taizo; Shimano, Shizuo; and Mochizuki, Seiji, 4,690,934, Cl. 514-354.000.
Konishi, Masataka: *See*—
Saitoh, Kyoichiro; Konishi, Masataka; and Tomita, Koji, 4,690,926, Cl. 514-269.000.
Konishi, Motoyuki: *See*—
Tsunoyama, Kouzou; Ohashi, Yoshiharu; Furunushi, Yasuko; and Konishi, Motoyuki, 4,690,558, Cl. 356-318.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Fujiwhara, Mitsuto; Nimura, Takao; Numata, Yasumasa; and Matsubara, Yasuko, 4,690,888, Cl. 430-549.000.
Naoe, Masahiko; and Ishibashi, Shozo, 4,690,744, Cl. 204-192.110.
Kono, Motomichi: *See*—
Shirahata, Kunikatsu; Kono, Motomichi; Saito, Yutaka; Kasai, Masaji; Morimoto, Makoto; and Ashizawa, Tadashi, 4,691,024, Cl. 548-422.000.
Kopelowicz, Alberto. Anchoring devices for joining overlapping cloths for garments or articles manufactured with them. 4,689,861, Cl. 24-662.000.
Koperdak, Edward A., to Cope, Inc. Coving attachment. 4,690,382, Cl. 256-1.000.
Kopp, Beatrice J.: *See*—
Squires, Charles H.; Heefner, Donald L.; Evans, Ronald J.; Kopp, Beatrice J.; and Yarus, Michael J., 4,690,897, Cl. 435-320.000.
Koppensteiner, James V.; and Kubik, Charles K., to GTE Communication Systems Corporation. Wire formed cable brackets. 4,690,356, Cl. 248-68.100.
Kordel, Gerhard: *See*—
Brede, Uwe; and Kordel, Gerhard, 4,690,056, Cl. 102-202.200.
Korn, Siegfried: *See*—
Daniels, Erwin J.; and Korn, Siegfried, 4,690,524, Cl. 351-168.000.
Kosaka, Masato; and Yamazaki, Tatsu, to Kayaba Kogyo Kabushiki Kaisha. Axial piston pump or motor with multi position swash plate. 4,690,036, Cl. 91-506.000.
Koshinaka, Osamu: *See*—
Mikuni, Yoshio; and Koshinaka, Osamu, 4,690,080, Cl. 112-162.000.
Kostylev, Alexandr D.: *See*—
Tupitsyn, Konstantin K.; Tupitsyn, Sergei K.; Kostylev, Alexandr D.; Kamensky, Veniamin V.; and Chufistov, Sergei A., 4,690,225, Cl. 173-116.000.
Kotraro, Reuven: *See*—
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,765, Cl. 210-654.000.
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,766, Cl. 210-654.000.
Kottke, Joachim; and Zerrer, Gerhard, to Andreas Stihl. Rotation-preventing locking device for a portable tool. 4,690,252, Cl. 188-69.000.
Kotzin, Bernard. Caster having interfitting housing members with integral bearings and a separate axle. 4,689,848, Cl. 16-46.000.
Kouchiwa, Taira; and Nishina, Kiichiro, to Ricoh Company, Ltd. Wide angle copying lens system. 4,690,518, Cl. 350-464.000.
Koumoto, Teruo: *See*—
Sato, Susumu; Honda, Haruyoshi; Koumoto, Teruo; Isomae, Kazuo; Kuraishi, Tadayuki; and Katori, Tatsuhiko, 4,690,924, Cl. 514-237.000.
Koves, Thomas. Canvas carrier. 4,690,363, Cl. 248-449.000.
Koya, Kazuo: *See*—
Yokokawa, Kiyoshi; and Koya, Kazuo, 4,690,504, Cl. 350-96.340.
Koyama, Hiroshi: *See*—
Nishioka, Tadashi; Koyama, Hiroshi; and Mashiko, Yoji, 4,691,078, Cl. 174-68.500.
Koyama, Kenji; and Ohno, Shotaro, to Toyo Soda Manufacturing Co., Ltd. Filter device for a minute volume of liquid. 4,690,754, Cl. 210-94.000.
Koyama, Takeo: *See*—
Nakamura, Teiji; Nishikawa, Eiichiro; and Koyama, Takeo, 4,691,070, Cl. 585-273.000.
Koyo Seiko Co., Ltd.: *See*—
Daido, Toshihiko, 4,690,233, Cl. 180-142.000.
Koziar, Gregory: *See*—
Malcosky, Norman D.; and Koziar, Gregory, 4,690,689, Cl. 48-174.000.
Kozlowski, James L.: *See*—
Miller, Alan L.; and Kozlowski, James L., 4,691,276, Cl. 364-148.000.
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, to Canon Kabushiki Kaisha. Information reproducing apparatus. 4,691,256, Cl. 360-73.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Kanczarek, Thaddaeus-Anton, 4,690,438, Cl. 285-363.000.
Weber, Robert; Bieselt, Roland; Forner, Siegfried; and Mechtold, Helmut, 4,689,863, Cl. 29-33.00T.
Kramer, William M., to RCA Corporation. Imaging device having two anti-reflection layers on a surface of silicon wafer. 4,689,873, Cl. 437-2.000.
Krankenhagen, Jochen: *See*—
Castagna, Wolfgang; Krankenhagen, Jochen; Ortwein, Heinz; and Weertz, Klaus, 4,690,081, Cl. 112-276.000.
Kraus, Gunter, to Sigri GmbH. Electrode connection. 4,691,324, Cl. 373-91.000.
Kretschmer, Helmut: *See*—
Reichel, Anton; Lohmann, Bernard; Kolb, Eugen; Hochkonig, Manfred; Burst, Hermann; and Kretschmer, Helmut, 4,690,204, Cl. 165-44.000.
Krieger, Allen: *See*—
Burstein, Paul; Krieger, Allen; Annis, Martin; and Chase, Richard C., 4,691,332, Cl. 378-7.000.
Krieger Corporation: *See*—
Krieger, David, 4,690,084, Cl. 112-266.100.
Krieger, David, to Krieger Corporation. Production of puffed embroidered design fabrics. 4,690,084, Cl. 112-266.100.
Krocheski, Thomas L.: *See*—
Churchward, Reed R.; and Krocheski, Thomas L., 4,691,303, Cl. 365-222.000.
Kronstadt, Eric P.; Gheewala, Tushar R.; and Gandhi, Sharad P., to International Business Machines Corp. Small instruction cache using branch target table to effect instruction prefetch. 4,691,277, Cl. 364-200.000.
Krupa, Andrew S.: *See*—
Velenyi, Louis J.; and Krupa, Andrew S., 4,690,814, Cl. 423-648.00R.
Krupick, Walter J.: *See*—
Ljung, Bo H. G.; and Krupick, Walter J., 4,691,323, Cl. 372-107.000.
Krupp Polysius AG: *See*—
Allers, Tyark; and Blaszcyk, Gotthardt, 4,690,335, Cl. 241-24.000.
Krzepinski, Horst. Rotational mold system with multiple stations. 4,690,626, Cl. 425-88.000.
Kubik, Charles K.: *See*—
Koppensteiner, James V.; and Kubik, Charles K., 4,690,356, Cl. 248-68.100.
Kubo, Kanji, to Honda giken Kogyo Kabushiki Kaisha. Shock absorber mount assembly for motor vehicle suspension. 4,690,425, Cl. 280-668.000.
Kubo, Kanji; Asanuma, Nobuyoshi; Saito, Kazuo; and Yamamoto, Yasuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Trailing arm joint structure. 4,690,426, Cl. 280-690.000.
Kubo, Seitoku: *See*—
Sumiya, Koji; Watanabe, Kazuaki; and Kubo, Seitoku, 4,690,037, Cl. 92-130.00R.
Kubodera, Seiiti; and Okazaki, Masaki, to Fuji Photo Film Co., Ltd.; and Fuji Photo Film Co., Ltd. Image forming process. 4,690,883, Cl. 430-203.000.
Kubota, Takao; and Ujii, Yasuo, to Sun Seiki Co., Ltd. Automatic film processor arrangement. 4,690,535, Cl. 354-322.000.
Kuck, John H., to United States of America, Air force. Automatic attenuator for sonobuoys. 4,691,305, Cl. 367-3.000.
Kudo, Takashi: *See*—
Mochida, Ei; Shinkai, Hiroyuki; Kudo, Takashi; and Sugawara, Toshiyuki, 4,690,908, Cl. 436-518.000.
Kuhn, George C. Patient motivation device. 4,689,842, Cl. 5-61.000.
Kuhne, Christoph, to Carl-Zeiss-Stiftung. Laser range finder. 4,690,550, Cl. 356-5.000.
Kuhnert, Siegfried: *See*—
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Heb-

binghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.

Kuker, Wolfgang; and Findeklee, Heinz, to Linke-Hofmann-Busch. Device for interconnecting a portal passageway between two rail vehicles. 4,690,067, Cl. 105-3.000.

Kulig, Constantine W., to Emhart Industries, Inc. Mold cooling arrangement for use in a glassware forming machine. 4,690,703, Cl. 65-265.000.

Kulinsky, Vladimir I.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.

Kumakawa, Shiro; and Yamamoto, Kazuyuki, to Teijin Limited. Polyester fiber. 4,690,866, Cl. 428-364.000.

Kumamoto, Kenichiro; Sato, Akira; Ohya, Koichi; and Matsuda, Koichi, to Sony Corporation. Tuner for television receiver. 4,691,378, Cl. 455-301.000.

Kumashiro, Masayuki: *See*—
Otsuka, Nobuyuki; Kasuya, Atsuo; Nakayama, Yusho; Kumashiro, Masayuki; Furuya, Tamio; and Kaiho, Shigeo, 4,689,979, Cl. 72-57.000.

Kumazawa, Satoru: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.

Kumekawa, Norio: *See*—
Hirose, Takao; and Kumekawa, Norio, 4,690,494, Cl. 350-96.200.

Kung, Patrick C.; and Goldstein, Gideon, to Ortho Pharmaceutical Corporation. Hybrid cell line for producing monoclonal antibody to a human early thymocyte antigen, antibody, and methods. 4,691,010, Cl. 530-387.000.

Kuniyoshi, Shinji: *See*—
Sugiyama, Shuji; Syohda, Shuji; and Kuniyoshi, Shinji, 4,690,529, Cl. 353-122.000.

Kuno, Hiroaki: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.

Kuntze-Fechner, Gerald; Friedberger, Otmar; and Hahn, Michael, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Rotor, especially for rotary wing aircraft. 4,690,615, Cl. 416-134.00A.

Kuntze-Fechner, Gerald: *See*—
Hahn, Michael; and Kuntze-Fechner, Gerald, 4,690,616, Cl. 416-134.00A.

Kunz, Hans-Peter: *See*—
Peter, Rudolf; Jahnel, Ernst; and Kunz, Hans-Peter, 4,690,261, Cl. 192-87.130.

Kupper, Philip L.; Moore, Katherine L.; and Swaine, Robert L., Jr., to Procter & Gamble Company, The. Fruit juice containing diet beverage. 4,690,827, Cl. 426-548.000.

Kuraishi, Tadayuki: *See*—
Sato, Susumu; Honda, Haruyoshi; Koumoto, Teruo; Isomae, Kazuo; Kuraishi, Tadayuki; and Katori, Tatsuhiko, 4,690,924, Cl. 514-237.000.

Kuramochi, Koujiro: *See*—
Takahashi, Tokuyuki; Kuramochi, Koujiro; and Sayou, Syoichi, 4,690,239, Cl. 180-249.000.

Kurata, Kouichi: *See*—
Kimura, Shigeo; and Kurata, Kouichi, 4,691,060, Cl. 568-420.000.

Kureha Gosen Kabushiki Kaisha: *See*—
Fukuda, Ken; and Ueba, Hisaaki, 4,690,849, Cl. 428-91.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.
Fukuda, Ken; and Ueba, Hisaaki, 4,690,849, Cl. 428-91.000.
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.

Kuriyama, Takashi: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; and Kuriyama, Takashi, 4,691,227, Cl. 358-47.000.

Kurusu, Yasuo; and Morizumi, Yoshiaki, to Dainippon Screen Mfg. Co., Ltd. Image input device and a method of correcting input signals of the same. 4,691,240, Cl. 358-282.000.

Kusch, Hans-Jurgen: *See*—
Maul, Bernhard; Zobl, Gunter; and Kusch, Hans-Jurgen, 4,690,394, Cl. 271-11.000.

Kuthi, Osaba: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Osaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

Kuwagaki, Hiroshi: *See*—
Takamatsu, Toshiaki; Kuwagaki, Hiroshi; Minezaki, Shigehiro; Yamamoto, Kunihiko; Nakatani, Hiroshi; and Kawaguchi, Hisao, 4,690,510, Cl. 350-334.000.

Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Okrumi, Kiyoshi, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Heat transfer tube for single phase flow. 4,690,211, Cl. 165-177.000.

Kuwahara, Takanori: *See*—
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, 4,691,053, Cl. 562-531.000.

Kuwata, Yutaka; and Nerone, Louis R., to Nippon Telegraph & Telephone Corp.; and Reliance Comm/Tec Corporation. Series resonant converter with parallel resonant circuit. 4,691,273, Cl. 363-132.000.

Kuznetsova, Galina A.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.

Kuzyk, Roman; Bender, Richard H.; and Edwards, Lew, to ECB Technologies, Inc. Apparatus for producing internegatives. 4,690,546, Cl. 355-69.000.

Kyburz, Emilio: *See*—
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,691,040, Cl. 558-44.000.

Kyocera Corporation: *See*—
Nishiguchi, Yasuo; Yasutomi, Tsuyoshi; and Shiraishi, Ryoichi, 4,691,210, Cl. 346-76.0PH.

Kyotani, Ikuo, to G-C Dental Industrial Corp. Dental polishing strip. 4,690,642, Cl. 433-142.000.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See*—
Shirahata, Kunikatsu; Kono, Motomichi; Saito, Yutaka; Kasai, Masaji; Morimoto, Makoto; and Ashizawa, Tadashi, 4,691,024, Cl. 548-422.000.

La Telemecanique Electrique: *See*—
Bouteille, Daniel; Nicolas, Michel; and Guillin, Daniel, 4,690,035, Cl. 91-442.000.

Laabs, Timothy P.: *See*—
Wolnisk, Stanley C.; and Laabs, Timothy P., 4,689,977, Cl. 70-379.00R.

Labadie, Jeffrey W.: *See*—
Hiraoka, Hiroyuki; Labadie, Jeffrey W.; Lee, James H.; MacDonald, Scott A.; and Willson, Carlton G., 4,690,838, Cl. 427-343.000.

Labler, Ludwig: *See*—
Furst, Andor; Labler, Ludwig; and Meier, Werner, 4,691,032, Cl. 549-450.000.

Laboratoire L. Lafon: *See*—
Lafon, Louis, 4,690,950, Cl. 514-626.000.

Laboratorios Madaus Cerafarm, S.A.: *See*—
Arechaga, Sabastian J.; Granell, Jose O. O.; Linan, Carmen S.; Vallejo, Alfonso P.; and Gabarro, Jose A. P., 4,690,945, Cl. 514-448.000.

Labstystems Oy: *See*—
Tervamaki, Jukka; and Jarvimaki, Kari, 4,690,005, Cl. 73-864.120.

Laby, Jordan M.: *See*—
Henkin, Melvyn L.; and Laby, Jordan M., 4,689,839, Cl. 4-542.000.

Lackey, Robert W.: *See*—
Fershko, Jane S.; and Lackey, Robert W., 4,690,287, Cl. 211-49.100.

Lacks Industries, Inc.: *See*—
Bramer, Charles, 4,690,013, Cl. 74-501.00M.

Lacoste, Olivier H. V.; De Regel, Alain; Fujiwara, Hidenori; and Yap, Raymond C. C., to Exxon Chemical Patents Inc. Road marking compositions. 4,690,958, Cl. 523-172.000.

Lafer, William: *See*—
Donson, William A.; Ellerson, James V.; Hammer, Richard B.; Lafer, William; and Snyder, Keith A., 4,690,833, Cl. 427-96.000.

Lafon, Louis, to Laboratoire L. Lafon. 1-[N-(α-amino-α-methylacetyl-)aminophenyl)-2-aminopropanone derivatives. 4,690,950, Cl. 514-626.000.

LaGarde, Robert; and Bouverot, Noel, to Rhone-Poulenc Specialites Chimiques. Heat-curable organopolysiloxane compositions. 4,690,967, Cl. 524-266.000.

Lahti, Archie E.: *See*—
Danilenko, Michael; Rusterholz, John T.; and Lahti, Archie E., 4,691,279, Cl. 364-200.000.

Laitinen, Herbert A.; and Hoshino, Shigeo, to University of Florida. Electrolytic bath compositions and method for electrodeposition of amorphous chromium. 4,690,735, Cl. 204-37.100.

Landphair, Donald K., to Deere & Company. Radial engagement drive coupler. 4,690,260, Cl. 192-71.000.

Lane, George A.; and Rossow, Harold E., to Dow Chemical Company, The. Hydrated calcium bromide reversible phase change composition. 4,690,769, Cl. 252-70.000.

Lange, Gottfried, to Siemens Aktiengesellschaft. X-ray image converter. 4,691,232, Cl. 358-111.000.

Lange, Philip E., to Aero-Metric General, Inc. Circuit status indicating device with improved switch on/off detection capability. 4,691,143, Cl. 315-133.000.

Langen, Manfred, to W. Schlafhorst & Co. Textile machine for producing cross-wound bobbins. 4,690,342, Cl. 242-35.50A.

Lapham, James M.: *See*—
Belanger, James A.; Wentworth, Robert; and Lapham, James M., 4,690,065, Cl. 104-172.300.

Larsen, Marvin L., to Tri/Mark Corporation. Pop-up handle assembly. 4,689,976, Cl. 70-208.000.

Larson, Jon; and Larson, Van. Layered inner sole. 4,689,899, Cl. 36-44.000.

Larson, Van: *See*—
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Lauer, Fredy, to Sulzer Brothers Limited. Threaded connection having multi-part threaded bolt. 4,690,600, Cl. 411-263.000.
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Ledzius, Robert C.; and Allen, Steven P., to Motorola, Inc. Self-compensating, maximum speed integrated circuit. 4,691,124, Cl. 307-303.000.
Lee, Hee J., to Gold Start Co., Ltd. Preventing twist of a microwave temperature probe line. 4,691,087, Cl. 219-10.55B.
Lee, James H.: *See*—
Hiraoka, Hiroyuki; Labadie, Jeffrey W.; Lee, James H.; MacDonald, Scott A.; and Willson, Carlton G., 4,690,838, Cl. 427-343.000.
Lee, Robert D.: *See*—
Haslim, Leonard A.; and Lee, Robert D., 4,690,353, Cl. 244-134.00D.
Lehrach, Ronald P. C.: *See*—
Kay, Ira W.; and Lehrach, Ronald P. C., 4,691,288, Cl. 364-511.000.
Leible, Walter T.: *See*—
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Leipold, Ludwig: *See*—
Einzinger, Josef; Fellinger, Christine; Leipold, Ludwig; Tihanyi, Jenoe; and Weber, Roland, 4,691,129, Cl. 307-581.000.
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Trage, Burkhard; and Leitz, Richard, 4,690,207, Cl. 165-113.000.
Lekander, Karl-Erik: *See*—
Hartler, Nils J. C.; Lekander, Karl-Erik; Sjodin, Lars T.; and Mjoberg, Per J., 4,690,731, Cl. 162-45.000.
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Lemmens, Godfried. Process for decontaminating materials contaminated by radioactivity. 4,690,782, Cl. 252-626.000.
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Meyer, Armin, 4,690,280, Cl. 206-554.000.
Lemonnier de Gouville, Jean B.; and Dane, Bernard, to Sourdillon-Airindex. Flat type gas burner, more particularly for household appliances, adapted for using different gases. 4,690,636, Cl. 431-354.000.
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Leonard, Mark G., to Hewlett-Packard Company. Optical positional encoder comprising immediately adjacent detectors. 4,691,101, Cl. 250-231.0SE.
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Leung, Tommy Y.: *See*—
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Pelley, Perry H., III; and Lewandowski, Alan, 4,691,300, Cl. 365-200.000.
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Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Hollaway, Gerald C., Jr.; and Nelson, Jack, 4,690,665, Cl. 474-245.000.
Lewis, John C., Jr., to Tucel Industries, Inc. Prepackaged fused synthetic brushes. 4,690,277, Cl. 206-362.100.
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Li, Chou H. Method of making active solid state devices. 4,690,714, Cl. 437-208.000.
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Wulff, Hans-Jurgen, 4,691,184, Cl. 337-49.000.
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Liebig, Heinrich. Positive arrangement for fastening a dowel. 4,690,597, Cl. 411-32.000.
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Cho, Shoji, 4,690,401, Cl. 272-137.000.
Lim, Franklin, to Damon Biotech, Inc. Sustained release. 4,690,682, Cl. 604-891.000.
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Andrew, Sydney P.; Doy, Ralph J.; and Limbach, Antony P. J., 4,690,690, Cl. 48-214.00A.
Lin, Der J.: *See*—
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Arechaga, Sabastian J.; Granell, Jose O. O.; Linan, Carmen S.; Vallejo, Alfonso P.; and Gabarro, Jose A. P., 4,690,945, Cl. 514-448.000.
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Ranke, Gerhard; and Schrader, Ulrich, 4,690,812, Cl. 423-359.000.
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, to Aligena AG. Chemically modified semipermeable membranes and their use in reverse osmosis and ultrafiltration. 4,690,765, Cl. 210-654.000.
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Kuker, Wolfgang; and Findeklee, Heinz, 4,690,067, Cl. 105-3.000.
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Janke, Donald E.; and Linstromberg, William J., 4,689,965, Cl. 62-155.000.
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Owa, Yutaka, 4,690,589, Cl. 405-263.000.
Sekimoto, Yukihiko; Yanagita, Makoto; and Kanda, Shoichi, 4,691,013, Cl. 536-96.000.
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Beyer, Karl, 4,689,851, Cl. 16-228.000.
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Herngren, Torbjorn; and Lofthus, Jon, 4,690,634, Cl. 431-8.000.
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Hamilton, Douglas D.; Palfy, Robert M.; and Viereck, Hans, 4,690,185, Cl. 144-34.00R.
Lohmann, Bernard: *See*—
Reichel, Anton; Lohmann, Bernard; Kolb, Eugen; Hochkonig, Manfred; Burst, Hermann; and Kretschmer, Helmut, 4,690,204, Cl. 165-44.000.
Lohner, Manfred; and Posselt, Klaus, to Dolorgiet Beteiligungs-GmbH. Ibuprofen-containing soft gelatin capsules and process for preparing same. 4,690,823, Cl. 424-456.000.
Loiacono, Joseph, to Kenco Optics, Inc. Monolithic reinforced eyeglass frame and friction welding method for manufacturing same. 4,690,523, Cl. 351-129.000.
Long, William B.: *See*—
Hamsher, Wilbur A., Jr.; and Long, William B., 4,690,647, Cl. 439-92.000.
Looker, Robert, to Satco, Inc. Cargo pallet. 4,690,360, Cl. 248-346.000.
Looney, Kevin: *See*—
Mathus, Gregory; Lyman, George; and Looney, Kevin, 4,690,757, Cl. 210-232.000.
Loor, Rueyming; M'Timkulu, Thabiso; and DeWitt, Susanne K., to Cetus Corporation. Process for simultaneously detecting multiple antigens using dual sandwich immunometric assay. 4,690,890, Cl. 435-7.000.
Loos, Herbert; and Erhardt, Manfred, to Carl Hurth Maschinen-und Zahnradfabrik Gmbh & Co. Apparatus for manufacturing and working of gears. 4,689,918, Cl. 51-105.0GG.
Lord Corporation: *See*—
Rende, Anthony V., Jr., 4,690,966, Cl. 524-264.000.
L'Oreal: *See*—
Grollier, Jean-Francois; Cotteret, Jean; Junino, Alex; and Genet, Alain, 4,690,685, Cl. 8-405.000.

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Walther, Norbert; Lucas, August; Lorenz, Kurt; and Bruns, Engelbert, 4,690,160, Cl. 134-181.000.

Losada, Robert J.; and Conway, Hugh T., to Becton, Dickinson and Company. Flow inducing means for small volume containers. 4,690,153, Cl. 128-763.000.

Lotz, Alexander; and Stevermuer, Heinrich, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Coal processing settling machine. 4,690,753, Cl. 209-496.000.

Loubier, Robert J.; and Bleeke, William F., to Xolox Corporation. Solid state magnetic microswitch. 4,691,185, Cl. 338-32.00H.

Loup, Didier, to Valeo. System for holding an electric motor in a housing. 4,690,366, Cl. 248-676.000.

Lowery, Richard K., Sr.: *See*—
Finan, Anthony T., Sr.; Lowery, Richard K., Sr.; and Leible, Walter T., 4,689,937, Cl. 53-502.000.

Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., to Institut Organicheskoi Khimii Ordena Lenina I Ordena Druzhby Narodov Akademii Nauk Ukrainskoi SSR; and Institut Farmakologii Akademii Meditsinskikh Nauk SSSR. Butanedioic acid mono [(2-dimethylamino] ethyl ester)-succinate. 4,691,046, Cl. 560-196.000.

Lu, Jing-Jong, to International Minerals & Chemical Corp. Halogenated resorcylic acid lactone derivatives. 4,690,948, Cl. 514-544.000.

Lu, Neng H.: *See*—
Clarke, Thomas C.; Lu, Neng H.; Tomkiewicz, Yaffa; and Tong, Ho M., 4,690,836, Cl. 427-299.000.

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DiBiase, Stephen A.; and Vinci, James N., 4,690,767, Cl. 252-47.000.
Johnston, Thomas E.; and Dorer, Casper J., Jr., 4,690,687, Cl. 44-67.000.

Lucas, August: *See*—
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Lucas, Gerard; Dussaud, Jacques; and Leroy, Andre , to Boussac Saint Freres B. S. F. Egg timer-shaped absorbent pad for a pair of nappy-pants, and process for the continuous manufacture of such pads. 4,690,719, Cl. 156-201.000.

Lucas Industries public limited company: *See*—
Stratton, John F., 4,689,961, Cl. 60-748.000.

Luchsinger, Pedro W. Sprayer and diaphragm pump therefor. 4,690,331, Cl. 239-333.000.

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Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, 4,691,110, Cl. 250-458.100.

Lue, Hsueh C., to U.S. Philips Corp. Container for electronic components. 4,690,274, Cl. 206-328.000.

Luine, George J.; and Luine, John L. Bottle mounted adjustable liquor dispensing device. 4,690,313, Cl. 222-454.000.

Luine, John L.: *See*—
Luine, George J.; and Luine, John L., 4,690,313, Cl. 222-454.000.

Luiset, Jean-Jacques; and Seigneurin, Michel, to Micro-Mega S.A. Contra-angle or turbine head of a dental handpiece. 4,690,641, Cl. 433-129.000.

Luma Guard, Inc.: *See*—
Hoshal, Dale E., 4,690,419, Cl. 280-154.50R.

Lundin, Lars, to Oy Lars Lundin Patent AB. Oil-spill-combatting water craft. 4,690,093, Cl. 114-270.000.

Lundman, Philip L. Jack stand and method for making a jack stand. 4,690,361, Cl. 248-352.000.

Luryi, Sergey, to American Telephone and Telegraph Company; and AT&T Bell Laboratories. Hot electron unipolar transistor with two-dimensional degenerate electron gas base with continuously graded composition compound emitter. 4,691,215, Cl. 357-22.000.

Luther, Lars C.; and Singh Rana, Virendra V., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Liquid phase epitaxial growth of bismuth-containing garnet films. 4,690,726, Cl. 156-624.000.

Lyddy, James E.; and Fincke, Randall W. Method and apparatus for regulating fluid flow. 4,690,162, Cl. 137-1.000.

Lyddy, James E., Jr.; Penland, William Z.; and Sugarbaker, Paul H., to United States of America, Health and Human Services. Medical apparatus. 4,690,131, Cl. 128-4.000.

Lyman, George: *See*—
Mathus, Gregory; Lyman, George; and Looney, Kevin, 4,690,757, Cl. 210-232.000.

Lyons, Alan M.; Mendenhall, Frederick T., Jr.; Robbins, Murray; Quick, Nathaniel R.; and Wilkins, Cletus W., Jr., to AT&T Technologies; and AT&T Bell Laboratories. Direct writing of conductive patterns. 4,691,091, Cl. 219-121.0LM.

M.A.N. - B&W Diesel GmbH: *See*—
Schroder, Joachim; Bozung, Hanns-Gunter; Bandel, Rudolf; and Mendle, Hans, 4,689,960, Cl. 60-607.000.

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Cappel, Bert; Knapp, Karl L.; and Jung, Adolf, 4,690,054, Cl. 101-409.000.

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MacDonald, Scott A.: *See*—
Hiraoka, Hiroyuki; Labadie, Jeffrey W.; Lee, James H.; MacDonald, Scott A.; and Willson, Carlton G., 4,690,838, Cl. 427-343.000.

MacFee, Norman W., to Talon, Inc. Reclosable bulk material bag with slide fastener. 4,691,370, Cl. 383-61.000.

Machida, Hajime: *See*—
Nakamura, Hitoshi; Kaneko, Yujiro; Sawada, Yasuo; Machida, Hajime; Omi, Fumiya; and Watada, Atsuyuki, 4,690,861, Cl. 428-623.000.

Mack, Jory B., to Pamco Label Co. Method of manufacturing multilayer labels and apparatus therefor. 4,690,720, Cl. 156-248.000.

Madate, Haruhisa: *See*—
Kobayashi, Kazunobu; Sekiguchi, Kyoji; Matsumura, Isao; and Madate, Haruhisa, 4,690,525, Cl. 351-206.000.

Madaus & Co.: *See*—
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Madden, William M., to United Technologies Corporation. Exhaust nozzle coupled with reverser exhaust door. 4,690,329, Cl. 239-265.190.

Maeda, Kiyoshi: *See*—
Tomohisa, Kunio; Maeda, Kiyoshi; and Cho, Masamichi, 4,691,241, Cl. 358-293.000.

Maeda, Satoru; and Tao, Akihiko, to Sony Corporation. Image information accessing user terminal. 4,691,340, Cl. 379-96.000.

Maeda, Takanori, to Pioneer Electronic Corporation. Focus control device. 4,691,098, Cl. 250-201.000.

Machara, Sigeharu, to Sharp Kabushiki Kaisha. Copying apparatus. 4,690,545, Cl. 355-51.000.

Magatti, Charles V.: *See*—
Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,691,049, Cl. 562-553.000.

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Maher, Timothy R.: *See*—
Gregorich, Edward E.; and Maher, Timothy R., 4,690,245, Cl. 181-272.000.

Maier, Helmut; Neumann, Bruno; and Schaafhausen, Ludwig R., to Exibeico GmbH. Connecting element for structural framework. 4,690,582, Cl. 403-252.000.

Makino, Hiroshi; and Sasaki, Akio, to Mikuni Kogyo Kabushiki Kaisha. EGR valve device of internal combustion engines of automobiles. 4,690,119, Cl. 123-571.000.

Makino, Hiroshi; and Nakatani, Masayuki, to Ube Industries, Ltd. Gas separating material. 4,690,873, Cl. 428-473.500.

Makino, Masayuki, to NEC Corporation. Line switching circuit for cordless telephone. 4,691,338, Cl. 379-61.000.

Makley, James A.: *See*—
Hamisch, Paul H., Jr.; Makley, James A.; Pabodie, Robert M.; and Strausburg, Larry D., 4,690,317, Cl. 227-67.000.

Malashenko, Leon, to John T. Hepburn, Limited. Hydraulic press with side slab guided upper platen. 4,690,049, Cl. 100-214.000.

Malaubier, Francois: *See*—
Vidal, Jean; Malaubier, Francois; and Mevel, Jean-Claude, 4,690,075, Cl. 110-264.000.

Malcosky, Norman D.; and Koziar, Gregory, to Columbia Gas System Service Corp. Gas tracer composition and method. 4,690,689, Cl. 48-174.000.

Malhi, Satwinder D. S., to Texas Instruments Incorporated. Method of forming vertically integrated current source. 4,689,871, Cl. 437-40.000.

Maloney, Bobby J.: *See*—
Bakr, Mamdouh M.; and Maloney, Bobby J., 4,690,466, Cl. 312-29.000.

Mamizuka, Mitsuru: *See*—
Furuta, Hideya; Koizumi, Yutaka; Mamizuka, Mitsuru; and Sakai, Yoshihiro, 4,690,542, Cl. 355-4.000.

Mandy, Zoltan A., to Frick Company. Centrifugal and impingement oil separator. 4,690,759, Cl. 210-304.000.

Manini, Benito: *See*—
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Mannesmann Rexroth GmbH: *See*—
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Manning, Thomas J.; Ritzert, Jack L.; Blouin, Joseph D.; and Mowinski, Josephine A. Hose coupling. 4,690,435, Cl. 285-256.000.

Manno, Eugene J., to Xerox Corporation. Developer system for reproduction and printing machines. 4,690,540, Cl. 355-3.0DD.

Mantegani, Sergio: *See*—
Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; and Salvati, Patricia, 4,690,929, Cl. 514-288.000.

Marabotto, Eduardo J.; and Bresin, Mark S., to Motorola, Inc. RF interconnect with triaxial self-alignment. 4,690,471, Cl. 439-63.000.

Marchisio, Aldo; and Beccaris, Carlo, to Valeo. Torsional damper device. 4,690,659, Cl. 464-68.000.

Marette, Gilles: *See*—
Rouly, Eric; Dubuit, Jean-Louis; and Marette, Gilles, 4,690,050, Cl. 101-35.000.

Marggraff, Fritz. Boat with a raisable and lowerable keel. 4,690,089, Cl. 114-141.000.

Marginvest S.A. Holding: *See*—
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Marin-Tek, Inc.: *See*—
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Marinoni, Mario, to Casma di V. Marinoni & Figli. Hinge member for an all-glass plate member including a metal fitting. 4,689,853, Cl. 16-382.000.

Mark, David S. Sound actuated switch. 4,690,242, Cl. 181-0.500.

Markin, Valentin A.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.

Markovsky, Leonid N.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.

Marquis, Edward T.: *See*—
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Sanderson, John R.; Marquis, Edward T.; Smith, William A.; and Keating, Kenneth P., 4,691,035, Cl. 549-542.000.

Marsalona, Guy. Composite glove drying device. 4,689,897, Cl. 34-103.000.

Marshall, David: *See*—
Flesher, Peter; Clarke, John; and Marshall, David, 4,690,971, Cl. 524-555.000.

Marshall, James R.: *See*—
Hardin, Roy T., Jr.; and Marshall, James R., 4,690,795, Cl. 376-264.000.

Mertin, Cory I. Air conditioner evaporator system. 4,690,209, Cl. 165-150.000.

Martin, Dennis R.: *See*—
Draper, Reed T.; Pol, Kenneth J.; and Martin, Dennis R., 4,690,303, Cl. 221-131.000.

Martinelli, Robert M.: *See*—
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Maruman Golf Co., Ltd.: *See*—
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Maruyama, Osamu: *See*—
Sakakibara, Shigeru; Arimoto, Shunji; Ishikawa, Hidenobu; and Maruyama, Osamu, 4,690,987, Cl. 525-502.000.

Maruzen Sewing Machine Co., Ltd.: *See*—
Mikuni, Yoshio; and Koshinaka, Osamu, 4,690,080, Cl. 112-162.000.

Masaki, Yuichi: *See*—
Suzuki, Hideyuki; Terada, Katsunori; Masaki, Yuichi; and Morimoto, Kenji, 4,690,880, Cl. 430-313.000.

Mashiko, Yoji: *See*—
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Massachusetts Institute of Technology: *See*—
Edwards, Brian E.; and Biron, David G., 4,690,551, Cl. 356-5.000.
Rivest, Ronald L.; and Shamir, Adi, 4,691,299, Cl. 365-189.000.

Masterton, Walter D., to RCA Corporation. Color picture tube having shadow mask with varied aperture column spacing. 4,691,138, Cl. 313-403.000.

Masuda, Naosuke; and Sunaga, Sohsuke, to Jidosha Kiki Co., Ltd. Method for producing worm shaft for use in power steering apparatus. 4,689,983, Cl. 72-356.000.

Masuda, Yoshinori; Saito, Hiroshi; and Kobayashi, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. High molecular weight fluoroelastomer. 4,690,994, Cl. 526-254.000.

Masuyama, Tsutomu: *See*—
Uchimura, Mitsuo; and Masuyama, Tsutomu, 4,690,230, Cl. 177-229.000.

Mathus, Gregory; Lyman, George; and Looney, Kevin, to Costar Corporation. Small volume laboratory filter. 4,690,757, Cl. 210-232.000.

Matouk, Anthony F.; Hoffman, David C.; and Barrus, Donald M., to Modular Power Corporation. Modular electronic power supply. 4,691,274, Cl. 363-141.000.

Matsubara, Yasuko: *See*—
Fujiwhara, Mitsuto; Nimura, Takao; Numata, Yasumasa; and Matsubara, Yasuko, 4,690,888, Cl. 430-549.000.

Matsuda, Hitoshi; Okumura, Tsuguo; and Abe, Kazuharu, to Mitsubishi Monsanto Chemical Company. Biaxially drawn laminated films prepared by sequential stretching. 4,690,792, Cl. 264-235.800.

Matsuda, Koichi: *See*—
Kumamoto, Kenichiro; Sato, Akira; Ohya, Koichi; and Matsuda, Koichi, 4,691,378, Cl. 455-301.000.

Matsuda, Kumehiko; and Komai, Kensaku, to Sharp Kabushiki Kaisha. Automatic registration in an electronic cash register. 4,691,283, Cl. 364-405.000.

Matsuda, Shohei; and Iwakawa, Yoshihiro, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic braking pressure control apparatus. 4,690,464, Cl. 303-115.000.

Matsuda, Tadashi: *See*—
Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, 4,690,764, Cl. 210-629.000.

Matsufuji, Akihiro: *See*—
Miyoshi, Takahito; Fujiyama, Masaaki; Matsufuji, Akihiro; and Yamamoto, Nobuyuki, 4,690,863, Cl. 428-328.000.

Matsui, Kazuma: *See*—
Takeda, Kenji; Inagaki, Mitsuo; Sasaya, Hideaki; and Matsui, Kazuma, 4,690,465, Cl. 303-119.000.

Matsui, Tohru; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Focus detection system and lighting device therefor. 4,690,538, Cl. 354-403.000.

Matsui, Yoshiaki: *See*—
Toki, Masahisa; Satoh, Seiji; Matsui, Yoshiaki; Morihata, Kunio; and Murata, Toyoji, 4,689,944, Cl. 57-260.000.

Matsuishi, Tsutomu: *See*—
Tosa, Takafumi; Koga, Yoshihiro; and Matsuishi, Tsutomu, 4,691,054, Cl. 562-554.000.

Matsumoto, Hiroshi: *See*—
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.

Matsumoto, Kazuyuki; Hashimoto, Mashataka; and Iwata, Michiyoshi, to Teijin Seiki Company Limited. Robot arm drive apparatus of industrial robot. 4,690,010, Cl. 74-469.000.

Matsumoto, Shusaku: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,690,788, Cl. 264-22.000.

Matsumoto, Yukihiro: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Shiina, Takanori; Matsumoto, Yukihiro; and Muroya, Minoru, 4,690,121, Cl. 123-589.000.

Matsumura, Isao: *See*—
Kobayashi, Kazunobu; Sekiguchi, Kyoji; Matsumura, Isao; and Madate, Haruhisa, 4,690,525, Cl. 351-206.000.

Matsuo, Yoshikazu: *See*—
Nakamatsu, Toshio; Matsuo, Yoshikazu; Nishikuri, Masao; and Imada, Kunihiko, 4,690,686, Cl. 8-638.000.

Matsushita, Akira: *See*—
Takada, Susumu; Sasatani, Takashi; Shindo, Hirohisa; Matsushita, Akira; and Eigyo, Masami, 4,690,930, Cl. 514-293.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Honjo, Masahiro; and Hashima, Akio, 4,691,247, Cl. 358-319.000.
Juri, Tatsuro; Iketani, Akira; Yamamitsu, Chojuro; and Ide, Akifumi, 4,691,329, Cl. 375-122.000.
Nakajima, Yasuo; Yamamoto, Yoshiharu; Miyatake, Yoshito; Nagaoka, Yoshitomi; and Ono, Shusuke, 4,690,515, Cl. 350-432.000.
Yamane, Shigeki; Mori, Keijiro; and Sakamoto, Kyooya, 4,691,269, Cl. 363-41.000.

Matsushita Seiko Co., Ltd.: *See*—
Yamane, Shigeki; Mori, Keijiro; and Sakamoto, Kyooya, 4,691,269, Cl. 363-41.000.

Matsushita, Tsurumasa: *See*—
Sato, Masahiko; Kato, Kazutoshi; Ishibashi, Akira; and Matsushita, Tsurumasa, 4,691,154, Cl. 318-696.000.

Mattausch, Hans J., to Siemens Aktiengesellschaft. Circuit arrangement comprising a matrix-shaped memory arrangement for variably adjustable delay of digital signals. 4,691,302, Cl. 365-240.000.

Mattel, Inc.: *See*—
Crosson, Peter; Sanchez, Terry; Gray, Kevin; and Goldstein, Samuel M., 4,690,658, Cl. 446-429.000.

Mattingly, William B., III; Cabe, Alex W., Jr.; Chapas, Richard B.; and Sampson, Arthur J., Jr., to Johnson & Johnson. Coextruded apertured film sanitary napkin cover. 4,690,679, Cl. 604-383.000.

Matuz, Judit: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

Matzkin-Bridger, Andrew: *See*—
Hale, Charles S.; Matzkin-Bridger, Andrew; and Morse, Ronald W., 4,690,487, Cl. 350-96.210.

Maul, Bernhard; Zobl, Gunter; and Kusch, Hans-Jurgen, to Heidelberger Druckmaschinen AG. Stack stop assembly on a sheet feeder of a printing press. 4,690,394, Cl. 271-11.000.

Mauldin, Robert H.: *See*—
Reinhart, Charles W.; and Mauldin, Robert H., 4,691,080, Cl. 174-88.00R.

Maurer, Albert: *See*—
Rieger, Wolfhart; Gauckler, Ludwig; Maurer, Albert; and Kampfer, Konrad, 4,690,763, Cl. 210-496.000.

Mausner, Marvin L.; and Meinstein, Siegfried, to Witco Corporation. Low water neutralization to produce a highly active alkaryl sulfonate. 4,690,785, Cl. 260-505.00N.

Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See*—
Mertens, Horst M.; and Bogl, Leonhard, 4,690,098, Cl. 118-727.000.

Maxon Corporation: *See*—
Coppin, William, 4,690,635, Cl. 431-187.000.

Mayo, William T., Jr., to North American Philips Corporation. Producing pseudocolor images for diagnostic ultrasound imaging. 4,690,150, Cl. 128-660.000.

Mayr, Ernst: *See—*
Einsle, Guenter; Mayr, Ernst; Oestreich, Ulrich; Schoeber, Gernot; and Schrey, Wolfgang, 4,689,943, Cl. 57-90.000.

Mayuzumi, Tetsuya: *See—*
Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, 4,690,986, Cl. 525-479.000.

Mazda Motor Corporation: *See—*
Kohno, Kouji; Takubo, Hiroichi; and Ito, Toshinobu, 4,690,111, Cl. 123-192.00B.
Morishita, Tsuyoshi; Osaki, Sigemi; and Sakai, Noriyuki, 4,690,320, Cl. 228-194.000.
Nakayama, Hideo; Nakatani, Shuichi; Tanaka, Fusatoshi; and Hanafusa, Hiroyuki, 4,690,106, Cl. 123-52.00M.
Nishimura, Hirofumi; and Moritz, Yasuyuki, 4,690,110, Cl. 123-90.170.
Sakamoto, Toshinori; Hirashima, Isao; and Tsuji, Seiichi, 4,690,432, Cl. 280-775.000.

McAlevey, Richard J.; Muir, Malcolm D.; and van der Laan, Johan S., to Rice Multiphones, Inc. Multifunction two line telephone system. 4,691,345, Cl. 379-158.000.

McCabria, Jack L., to Westinghouse Electric Corp. Permanent magnet alternator power generation system. 4,691,119, Cl. 307-84.000.

McCarthy, Brian D.; and Edwards, Michael. Night vision goggle arrangement with automatic release. 4,689,834, Cl. 2-422.000.

McClellan, Gary C. Holster and handgrip extension for miniature handguns. 4,689,908, Cl. 42-71.020.

McCoy, Bing, to McCoy, Bing; and DeLaski, Donald. Pitch and amplitude calculator and converter which provides an output signal with a normalized frequency. 4,690,026, Cl. 84-1.190.

McCulloch, Robert M.; and Jorgensen, Ove, to Danfoss A/S. Actuator means for the control of a refrigeration system expansion valve. 4,689,968, Cl. 62-225.000.

McCullough, Edward W.: *See—*
Fredericks, Walter A.; and McCullough, Edward W., 4,690,661, Cl. 464-78.000.

McDaniel, Max P.; and Short, James N., to Phillips Petroleum Company. Polymerization process using a catalyst comprising a phosphate and with a bis-(cyclopentadienyl)chromium(II) compound. 4,690,990, Cl. 526-138.000.

McDermott, Julian A. Battery charging apparatus. 4,691,157, Cl. 320-2.000.

McDonald, J. Kevin. Foundation for building structure and method of constructing building structure utilizing same. 4,689,926, Cl. 52-169.110.

McElroy, Robert C. Computer harness adaptive tester. 4,690,475, Cl. 439-502.000.

McGeehan, Joseph P.; and Bateman, Andrew, to National Research Development Corporation. Data transmission using a transparent tone-in band system. 4,691,375, Cl. 455-71.000.

McGraghan, Thomas A.: *See—*
Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., 4,690,562, Cl. 356-361.000.

McGreevy, Francis T.; and Hahn, Karl W., to C. R. Bard, Inc. Meltable stent for anastomosis. 4,690,684, Cl. 623-12.000.

McInerney, Edward J.; Dornseif, E. Ronald; and Zetterquist, Norman E., to Genus, Inc. Interlayer dielectric process. 4,690,746, Cl. 204-192.320.

McKenna, Quentin M. Water sailing craft. 4,690,086, Cl. 114-39.000.

McKone, Henry J.: *See—*
Ritchie, Robert C.; McKone, Henry J.; and Stamm, Richard H., 4,690,789, Cl. 264-40.100.

McMahon, Colbert M.: *See—*
Moles, John A. G.; and McMahon, Colbert M., 4,690,007, Cl. 74-5.120.

McNennamy, John A.; and Nafziger, Steven, to Charbonneau & Godfrey Associates. Motor operated valve analysis and testing system. 4,690,003, Cl. 73-862.320.

McVey, Charles I.: *See—*
Scott, Curtis E.; and McVey, Charles I., 4,690,727, Cl. 156-635.000.

Mead Corporation, The: *See—*
Fershko, Jane S.; and Lackey, Robert W., 4,690,287, Cl. 211-49.100.

Mead Packaging Corporation, The: *See—*
Ganz, Robert H., 4,689,934, Cl. 53-398.000.

Mecca, John. Arterial regenerator. 4,690,140, Cl. 128-305.000.

Mechtold, Helmut: *See—*
Weber, Robert; Bieselt, Roland; Forner, Siegfried; and Mechtold, Helmut, 4,689,863, Cl. 29-33.00T.

MECT Corporation: *See—*
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.

Medtronic, Inc.: *See—*
Rise, Mark T.; and Stanton, David J., 4,690,144, Cl. 128-419.00R.

Meggs, Dennis. Bases for the game of baseball. 4,690,403, Cl. 273-25.000.

Mehren Rubber A/S: *See—*
Haaland, Per, 4,690,414, Cl. 277-207.00A.

Meier, Werner: *See—*
Furst, Asdor; Labler, Ludwig; and Meier, Werner, 4,691,032, Cl. 549-450.000.

Meinstein, Siegfried: *See—*
Mausner, Marvin L.; and Meinstein, Siegfried, 4,690,785, Cl. 260-505.00N.

Meitoh Denki Kohji Kabushiki Kaisha: *See—*
Asai, Masaki, 4,690,381, Cl. 254-394.000.

Melnikov, Leonid I.: *See—*
Gradoboev, Vladimir T.; Sitnikov, Alexandr E.; Klimenov, Alexandr M.; and Melnikov, Leonid I., 4,690,267, Cl. 198-396.000.

Menchetti, Robert J., to National Gypsum Company. Partition structure. 4,689,930, Cl. 52-277.000.

Mendenhall, Frederick T., Jr.: *See—*
Lyons, Alan M.; Mendenhall, Frederick T., Jr.; Robbins, Murray; Quick, Nathaniel R.; and Wilkins, Cletus W., Jr., 4,691,091, Cl. 219-121.0LM.

Mendle, Hans: *See—*
Schroder, Joachim; Bozung, Hanns-Gunter; Bandel, Rudolf; and Mendle, Hans, 4,689,960, Cl. 60-607.000.

Mendoza, Abel; and Otterbacher, Eric W., to Dow Chemical Company, The. Preparation of monoalkylated dihydroxybenzenes and novel compounds prepared thereby. 4,691,042, Cl. 560-61.000.

Mensies, Otto: *See—*
Gerritsen, Jan; and Mensies, Otto, 4,691,139, Cl. 313-413.000.

Merck & Co., Inc.: *See—*
Huff, Joel R.; Vacca, Joseph P.; and Baldwin, John J., 4,690,928, Cl. 514-285.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Bitsch, Roland, 4,690,902, Cl. 436-110.000.
Klein, Hans D., 4,690,745, Cl. 204-192.290.

Meritex S.r.l.: *See—*
Conti, Paolo; Conti, Gianni; Garibaldi, Franco; and Manini, Benito, 4,689,971, Cl. 66-25.000.

Mertens, Horst M.; and Bogl, Leonhard, to ATOMIKA Technische Physik GmbH; and Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Vacuum vapor-deposition system. 4,690,098, Cl. 118-727.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Frisch, Eberhard, 4,690,354, Cl. 244-158.00R.
Hahn, Michael; and Kuntze-Fechner, Gersild, 4,690,616, Cl. 416-134.00A.
Kuntze-Fechner, Gerald; Friedberger, Otmar; and Hahn, Michael, 4,690,615, Cl. 416-134.00A.

Messick, Virginia B.: *See—*
Hoffman, Dwight K.; Stevens, Michael G.; and Messick, Virginia B., 4,690,988, Cl. 525-502.000.

Messina, Richard: *See—*
Gabano, Jean-Paul; Broussely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, 4,690,877, Cl. 429-194.000.

Metabowerke GmbH & Co.: *See—*
Schaitzler, Albrecht; Schulz, Manfred; and Bartmann, Klaus, 4,690,226, Cl. 173-128.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Alig, Franz; Bocker, Heinrich; Neulinger, Franz; and Schummer, Helmut, 4,690,694, Cl. 55-4.000.

Metallurgiche Balzano S.p.A.: *See—*
Balzano, Savino, 4,690,047, Cl. 99-542.000.

Metalquimia, S.A.: *See—*
Corominas, Narciso L., 4,690,046, Cl. 99-533.000.

Metz, Charles L. Supinating barbells with means to set the force for rotatory motion. 4,690,400, Cl. 272-123.000.

Metz, Josef; Pehker, Manfred; and Zielinski, Erich, to Rheinmetall GmbH. Automatic loader for an armored vehicle having a rotatable turret. 4,690,031, Cl. 89-36.130.

Mevel, Jean-Claude: *See—*
Vidal, Jean; Malaubier, Francois; and Mevel, Jean-Claude, 4,690,075, Cl. 110-264.000.

Meyer, Alfred: *See—*
Frick, Willy; Meyer, Alfred; and Nyfeler, Robert, 4,690,942, Cl. 514-383.000.

Meyer, Armin, to Lemo M. Lehmacher & Sohn GmbH Maschinenfabrik. Detachable plastic bag pad and process for making same. 4,690,280, Cl. 206-554.000.

Meyer, Willy: *See—*
Fory, Werner; Gass, Karl; and Meyer, Willy, 4,690,707, Cl. 71-93.000.

Miale, Joseph N.: *See—*
Chen, Nai Y.; and Miale, Joseph N., 4,690,903, Cl. 435-161.000.

Miazga, Dennis E.; and Petery, James J., to Xerox Corporation. Feature deselect control. 4,691,317, Cl. 371-20.000.

Michaelson, Robert C., to Exxon Chemical Patents Inc. Production of tertiary olefins. 4,691,073, Cl. 585-639.000.

Michel, Jean-Pierre: *See—*
Arragon, Jean-Pierre; and Michel, Jean-Pierre, 4,691,352, Cl. 380-14.000.

Micro-Mega S.A.: *See—*
Luiset, Jean-Jacques; and Seigneurin, Michel, 4,690,641, Cl. 433-129.000.

Microcom, Inc.: *See—*
Bergins, Lewis A.; Amundson, Anthony P.; and Falk, Jerry, 4,691,314, Cl. 370-94.000.

Microelectronics Center of North Carolina: *See—*
Giammara, Beverly L.; and Hanker, Jacob S., 4,690,901, Cl. 436-86.000.

Microwave Ovens Limited: *See—*
Eke, Kenneth I., 4,691,088, Cl. 219-10.55F.

Miedeck, Karin: *See*—
Hegemann, Gunther; and Miedeck, Karin, 4,691,002, Cl. 528-289.000.
Mieyal, David F., to Donn Incorporated. Method of making honeycomb floor panel. 4,689,870, Cl. 29-469.500.
Mihata, Ichiro: *See*—
Mitani, Tomomasa; and Mihata, Ichiro, 4,690,968, Cl. 524-315.000.
Mikami, Yoshikatsu: *See*—
Numata, Shun-ichi; Fujisaki, Koji; Kinjo, Noriyuki; Imaizumi, Junichi; and Mikami, Yoshikatsu, 4,690,999, Cl. 528-188.000.
Mikuni Kogyo Kabushiki Kaisha: *See*—
Makino, Hiroshi; and Sasaki, Akio, 4,690,119, Cl. 123-571.000.
Mikuni, Yoshio; and Koshinaka, Osamu, to Maruzen Sewing Machine Co., Ltd. Overedge sewing machine. 4,690,080, Cl. 112-162.000.
Miller, Alan L.; and Kozlowski, James L., to Borg-Warner Industrial Products, Inc. Adaptive control system for mechanical seal assembly. 4,691,276, Cl. 364-148.000.
Miller, John; Barton, Richard O.; and Schaefer, Oscar H., to Grumman Aerospace Corporation. Jack stud. 4,690,365, Cl. 248-650.000.
Miller, John M.: *See*—
Barton, Richard O.; Bergin, Michael T.; and Miller, John M., 4,690,563, Cl. 356-375.000.
Miller, Michael J.: *See*—
Scheithauer, Richard A.; Vanderpool, Clarence D.; Miller, Michael J.; and Gingerich, Richard G. W., 4,690,710, Cl. 75-0.5AA.
Miller, Roy W., to Pullman Rail Leasing Inc. Hatch cover structure. 4,690,070, Cl. 105-377.000.
Minardi, John E.; and von Ohain, Hans P., to University of Dayton. Hot gas flow generator with no moving parts. 4,689,950, Cl. 60-204.000.
Minezaki, Shigehiro: *See*—
Takamatsu, Toshiaki; Kuwagaki, Hiroshi; Minezaki, Shigehiro; Yamamoto, Kunihiko; Nakatani, Hiroshi; and Kawaguchi, Hisao, 4,690,510, Cl. 350-334.000.
Minigrip, Incorporated: *See*—
Ausnit, Steven, 4,691,373, Cl. 383-63.000.
Van Erden, Donald L., 4,691,372, Cl. 383-63.000.
Ministry of International Trade & Industry: *See*—
Sato, Masaaki; Tanaka, Susumu; Kaeriyama, Kyoji; and Suda, Yoshio, 4,691,005, Cl. 528-380.000.
Minnesota Mining and Manufacturing Company: *See*—
Aasen, Steven M.; and Bryan, Thomas T., 4,691,039, Cl. 556-446.000.
King-Smith, Eric A.; ReMine, Walter J.; and Dufresne, Joel R., 4,690,145, Cl. 128-421.000.
Mitra, Sumita B.; and Mitra, Smarajit, 4,691,059, Cl. 568-333.000.
Minnesota Minning and Manufacturing Company: *See*—
Hubbard, Lloyd C.; and Clausen, Earl W., 4,690,002, Cl. 73-861.250.
Minolta Camera Kabukishi Kaisha: *See*—
Nakamura, Ikushi, 4,690,878, Cl. 429-1.000.
Minolta Camera Kabushiki Kaisha: *See*—
Ando, Makoto, 4,690,537, Cl. 354-402.000.
Fujino, Akihiko; Inoue, Manabu; Naksi, Masaaki; and Sekida, Minoru, 4,690,530, Cl. 354-21.000.
Matsui, Tohru; and Egawa, Takeshi, 4,690,538, Cl. 354-403.000.
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, 4,690,536, Cl. 354-402.000.
Miodownik, Saul: *See*—
Sigelman, Jesse L.; and Miodownik, Saul, 4,691,195, Cl. 340-545.000.
Mirell, Stuart G. Electromagnetic therapy control system. 4,690,130, Cl. 128-1.300.
Mitani, Tomomasa; and Mihata, Ichiro, to Dainippon Ink and Chemicals, Inc. Fluoroolefin copolymer, process for production thereof and composition containing said copolymer. 4,690,968, Cl. 524-315.000.
Mitchell, Francoise E. L., to Tidy Chain Pty. Ltd. Article storage and display device. 4,690,288, Cl. 211-113.000.
Mitchell, Robert J. C. S.: *See*—
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., 4,690,604, Cl. 414-403.000.
Mitra, Smarajit: *See*—
Mitra, Sumita B.; and Mitra, Smarajit, 4,691,059, Cl. 568-333.000.
Mitra, Sumita B.; and Mitra, Smarajit, to Minnesota Mining and Manufacturing Company. Copolymerizable UV stabilizers. 4,691,059, Cl. 568-333.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Fujioka, Hirofumi; and Inoue, Masami, 4,690,957, Cl. 522-31.000.
Hosaka, Shuroku; and Shiga, Masaaki, 4,691,260, Cl. 360-121.000.
Ichioka, Youichi, 4,690,243, Cl. 187-101.000.
Nishioka, Tadashi; Koyama, Hiroshi; and Mashiko, Yoji, 4,691,078, Cl. 174-68.500.
Ookawa, Katsuhiro, 4,691,250, Cl. 360-14.100.
Ookawa, Katsuhiro; Fujii, Toshifumi; and Nishida, Yoshihiro, 4,691,251, Cl. 360-14.100.
Takada, Ikunori, 4,691,224, Cl. 357-53.000.
Takata, Nobuharu, 4,691,156, Cl. 318-798.000.
Terada, Yasushi; and Nakayama, Takeshi, 4,691,216, Cl. 357-23.600.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Kimura, Shigeo; and Kurata, Kouichi, 4,691,060, Cl. 568-420.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Akatsu, Makoto; and Hori, Keiichi, 4,690,618, Cl. 417-226.000.
Kashiwazaki, Masamichi; Ogawa, Kiichiro; and Uchida, Satoshi, 4,689,949, Cl. 60-39.120.
Sasano, Ryoichiro; Toyohara, Tsutomu; and Takigawa, Toshimichi, 4,690,020, Cl. 82-2.00D.
Takahashi, Takehiro, 4,690,022, Cl. 83-308.000.
Mitsubishi Monsanto Chemical Company: *See*—
Fujino, Kiyoharu, 4,691,030, Cl. 549-255.000.
Matsuda, Hitoshi; Okumura, Tsuguo; and Abe, Kazuharu, 4,690,792, Cl. 264-235.800.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Nojiri, Naohiro; and Sakai, Yukio, 4,690,913, Cl. 502-340.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Ooe, Akihiko; Imaiida, Tetsuo; Uchida, Teruyoshi; and Kojima, Hirotaka, 4,690,147, Cl. 128-635.000.
Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, 4,690,986, Cl. 525-479.000.
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,690,974, Cl. 525-64.000.
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,690,975, Cl. 525-64.000.
Toki, Masahisa; Satoh, Seiji; Matsui, Yoshiaki; Morihata, Kunio; and Murata, Toyoji, 4,689,944, Cl. 57-260.000.
Mitsubishi Rayon Engineering Co., Ltd.: *See*—
Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, 4,690,764, Cl. 210-629.000.
Mitsuboshi Sangyo Co. Ltd.: *See*—
Iwasaki, Takashi; Tomita, Yasuo; and Hayashi, Tsunekazu, 4,690,839, Cl. 427-366.000.
Mitsui & Co., Ltd.: *See*—
Usui, Takayuki, 4,690,829, Cl. 426-661.000.
Mitutoyo Mfg., Co., Ltd.: *See*—
Nishina, Shingo, 4,689,890, Cl. 33-504.000.
Miura, Kuniaki; Okada, Yoshinori; Fukushima, Isao; and Otsuka, Susumu, to Hitachi, Ltd. Apparatus for multiplex recording and reproduction of audio and video signals. 4,691,246, Cl. 358-310.000.
Miyadera, Kazuhiko, to Toyota Jidosha Kabushiki Kaisha. Construction for mounting service hole blank cap of a console box. 4,690,241, Cl. 180-315.000.
Miyake, Akira: *See*—
Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,690,864, Cl. 428-336.000.
Miyakoshi Printing Machinery Co., Ltd.: *See*—
Kishine, Toshiaki; Izawa, Hideo; and Ohba, Masaru, 4,690,051, Cl. 101-211.000.
Miyakoshi, Shinichi, to Honda Giken Kogyo Kabushiki Kaisha. Three-wheeled motor vehicle. 4,690,235, Cl. 180-210.000.
Miyamoto, Takeaki: *See*—
Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, 4,690,973, Cl. 525-54.100.
Miyao, Ichiro: *See*—
Kawakita, Takao; and Miyao, Ichiro, 4,689,919, Cl. 51-206.00P.
Miyasato, Tsutomu: *See*—
Kaneko, Masahide; Hatori, Yoshinori; and Miyasato, Tsutomu, 4,691,230, Cl. 358-105.000.
Miyata, Hiroshi: *See*—
Izumi, Toshio; Saito, Ryozo; Kato, Yoichi; and Miyata, Hiroshi, 4,691,284, Cl. 364-424.000.
Miyata, Teruhisa: *See*—
Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,690,864, Cl. 428-336.000.
Miyata, Teruo: *See*—
Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, 4,690,973, Cl. 525-54.100.
Miyatake, Yoshito: *See*—
Nakajima, Yasuo; Yamamoto, Yoshiharu; Miyatake, Yoshito; Nagaoka, Yoshitomi; and Ono, Shusuke, 4,690,515, Cl. 350-432.000.
Miyazaki, Kunio: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hirosi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio, 4,690,793, Cl. 376-136.000.
Miyoshi, Kazunori: *See*—
Fukuda, Mitsutoshi; Fukutomi, Makoto; Kogure, Osamu; and Miyoshi, Kazunori, 4,690,887, Cl. 430-331.000.
Miyoshi, Takahito; Fujiyama, Masaaki; Matsufuji, Akihiro; and Yamamoto, Nobuyuki, to Fuji Photo Film Co., Ltd. Magnetic recording media and process for producing same. 4,690,863, Cl. 428-328.000.
Mizelle, Ned W. Recliner unit with novel locking and actuating mechanism. 4,690,454, Cl. 297-89.000.
Mizuhara, Howard, to GTE Products Corporation. Article comprising a ductile brazing alloy foil containing reactive metals and precious metals. 4,690,876, Cl. 428-606.000.
Mizuno, Takao: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.
Mizuno, Yoshikuni: *See*—
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yuusuke; and Joshita, Yutaka, 4,690,949, Cl. 514-561.000.
Mjoberg, Per J.: *See*—
Hartler, Nils J. C.; Lekander, Karl-Erik; Sjodin, Lars T.; and Mjoberg, Per J., 4,690,731, Cl. 162-45.000.

Mobay Corporation: *See*—
Schmidt, Manfred; and Yeater, Robert P., 4,690,964, Cl. 524-125.000.
Zeck, Walter M.; and Simonet, Donald E., 4,690,947, Cl. 514-521.000.
Mobil Oil Corporation: *See*—
Chen, Nai Y.; and Miale, Joseph N., 4,690,903, Cl. 435-161.000.
Oksuzler, Yalcin, 4,690,586, Cl. 405-209.000.
Mobil Solar Energy Corporation: *See*—
Gregory, James A.; Hanoka, Jack I.; and Vayman, Zinovy Y., 4,691,077, Cl. 136-256.000.
Mochida, Ei; Shinkai, Hiroyuki; Kudo, Takashi; and Sugawara, Toshiyuki, to Mochida Seiyaku Kabushiki Kaisha. Measuring reagent kit for determining an antigen, antibody or antigen-antibody complex. 4,690,908, Cl. 436-518.000.
Mochida Seiyaku Kabushiki Kaisha: *See*—
Mochida, Ei; Shinkai, Hiroyuki; Kudo, Takashi; and Sugawara, Toshiyuki, 4,690,908, Cl. 436-518.000.
Mochizuki, Seiji: *See*—
Yoshida, Hiroshi; Konishi, Kenji; Koike, Kengo; Nakagawa, Taizo; Shimano, Shizuo; and Mochizuki, Seiji, 4,690,934, Cl. 514-354.000.
Modecor Italiana S.p.A.: *See*—
Leolli, Franco, 4,690,289, Cl. 211-186.000.
Modular Power Corporation: *See*—
Matouk, Anthony F.; Hoffman, David C.; and Barrus, Donald M., 4,691,274, Cl. 363-141.000.
Mohanty, Bibhuti B., to C-I-L Inc. Smooth wall blasting in rock. 4,690,058, Cl. 102-312.000.
Mohr, Heinrich: *See*—
Schick, Hans; Kolk, Erich; Fauth, Karl-Heinz; and Mohr, Heinrich, 4,691,072, Cl. 585-525.000.
Mohr, Joachim: *See*—
Florek, Stefan; Becker-Ross, Helmut; Dobschal, Hans-Jurgen; and Mohr, Joachim, 4,690,559, Cl. 356-328.000.
Moles, John A. G.; and McMahon, Colbert M., to Short Brothers PLC. Gyroscope. 4,690,007, Cl. 74-5.120.
Molins PLC: *See*—
Calverley, Simon G.; Carter, David C. M.; Clarke, Peter A.; Dowding, John G.; Hawkins, David M.; and Mitchell, Robert J. C. S., 4,690,604, Cl. 414-403.000.
Gayfer, David; Starkey, Stanley V.; and Wareham, John G., 4,690,265, Cl. 198-347.000.
Mollett, Larry R.; and Goczalk, Robert W., to Hughes Aircraft Company. RF input drive saturation control loop. 4,691,173, Cl. 330-144.000.
Molnlycke AB: *See*—
Starzmann, Martin, 4,690,137, Cl. 128-132.00D.
Mon, George, to United States of America, Army. Variable linear resistor. 4,691,187, Cl. 338-114.000.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr.; Makley, James A.; Pabodie, Robert M.; and Strausburg, Larry D., 4,690,317, Cl. 227-67.000.
Hamisch, Paul H., Jr., 4,690,723, Cl. 156-541.000.
Mongeau, Peter P., to Electromagnetic Launch Research, Inc. Iron-free rotary disk electrical machine. 4,691,133, Cl. 310-178.000.
Monsanto Company: *See*—
Fung, Bill S. K.; and Hrutfiord, Bjorn F., 4,691,061, Cl. 568-432.000.
Nathan, Vaidy R.; Wang, John T.; and Downes, James E., 4,690,809, Cl. 423-306.000.
Paulik, Frank E.; Hershman, Arnold; Knox, Walter R.; and Roth, James F., 4,690,912, Cl. 502-161.000.
Moore, Katherine L.: *See*—
Kupper, Philip L.; Moore, Katherine L.; and Swaine, Robert L., Jr., 4,690,827, Cl. 426-548.000.
Morel, Simone. Obturating device for tubes, flasks and other containers, the opening and closing of which are controlled through rotation. 4,690,304, Cl. 222-44.000.
Morgan, David L., to Seymour-Sheridan, Inc. Swivel bellows assembly. 4,690,323, Cl. 236-99.00F.
Morgenrath, Jali. Electrical connector securing system. 4,690,476, Cl. 439-502.000.
Morgenstern, Bernd; Weigend, Helmut; and Reinhardt, Peter, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Device for measuring ink density on printed surfaces. 4,690,564, Cl. 356-445.000.
Mori, Kei. Light diverting device. 4,690,490, Cl. 350-96.150.
Mori, Keijiro: *See*—
Yamane, Shigeki; Mori, Keijiro; and Sakamoto, Kyooya, 4,691,269, Cl. 363-41.000.
Mori, Shinsaku: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,690,156, Cl. 128-804.000.
Mori, Shisaku: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,690,156, Cl. 128-804.000.
Mori, Takashi; Ohi, Nobuhiro; Ohsugi, Yoshiyuki; and Yamashita, Yasuhiro, to Chugai Seiyaku Kabushiki Kaisha. Pyridine derivatives and their use as anti-allergic agents. 4,691,018, Cl. 546-309.000.
Mori, Takehiko: *See*—
Inokuchi, Hiroo; Saito, Gunji; Seki, Kazuhiko; and Mori, Takehiko, 4,691,028, Cl. 549-36.000.
Mori, Yasuki: *See*—
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.
Morihata, Kunio: *See*—
Toki, Masahisa; Satoh, Seiji; Matsui, Yoshiaki; Morihata, Kunio; and Murata, Toyoji, 4,689,944, Cl. 57-260.000.
Morimoto, Kenji: *See*—
Suzuki, Hideyuki; Terada, Katsunori; Masaki, Yuichi; and Morimoto, Kenji, 4,690,880, Cl. 430-313.000.
Morimoto, Makoto: *See*—
Shirahata, Kunikatsu; Kono, Motomichi; Saito, Yutaka; Kasai, Masaji; Morimoto, Makoto; and Ashizawa, Tadashi, 4,691,024, Cl. 548-422.000.
Morishima, Kazuo: *See*—
Funabashi, Katsunori; Nakashima, Tai; Yamada, Toshiyuki; and Morishima, Kazuo, 4,690,237, Cl. 180-219.000.
Morishita Jintan Co., Ltd.: *See*—
Hata, Takehisa; Kanagawa, Nobuto; Morishita, Takashi; and Suzuki, Toshiyuki, 4,690,816, Cl. 424-456.000.
Morishita, Mimpei; and Azukizawa, Teruo, to Kabushiki Kaisha Toshiba. Electromagnetically floated carrier system with stopping unit. 4,690,066, Cl. 104-282.000.
Morishita, Takashi: *See*—
Hata, Takehisa; Kanagawa, Nobuto; Morishita, Takashi; and Suzuki, Toshiyuki, 4,690,816, Cl. 424-456.000.
Morishita, Tsuyoshi; Osaki, Sigemi; and Sakai, Noriyuki, to Mazda Motor Corporation. Method of bonding porous metallic members and product made by the method. 4,690,320, Cl. 228-194.000.
Morita, Fumiaki: *See*—
Sato, Akihiko; Noto, Akira; Morita, Fumiaki; and Nakajima, Kunihiro, 4,690,819, Cl. 424-88.000.
Morita, Yasuyuki: *See*—
Nishimura, Hirofumi; and Morita, Yasuyuki, 4,690,110, Cl. 123-90.170.
Morito, Makoto, to OKI Electric Industry Co., Ltd. Speech synthesizer with repeated symmetric segment. 4,691,359, Cl. 381-51.000.
Morizumi, Yoshiaki: *See*—
Kurusu, Yasuo; and Morizumi, Yoshiaki, 4,691,240, Cl. 358-282.000.
Morris, Gregory J.: *See*—
Beaver, Richard N.; Morris, Gregory J.; Pimlott, John R.; and Dang, Hiep D., 4,690,748, Cl. 204-279.000.
Morris, R. Scott: *See*—
Walsh, Myles A., III; and Morris, R. Scott, 4,690,741, Cl. 204-149.000.
Morrison, Donald L.; and Bartok, Stephen, to Standard Oil Company, The. Rolling shutter construction. 4,690,193, Cl. 160-133.000.
Morse, Ronald W.: *See*—
Hale, Charles S.; Matzkin-Bridger, Andrew; and Morse, Ronald W., 4,690,487, Cl. 350-96.210.
Mortensen, Alf. Control system for diverting/equalizing electrical potentials between two objects. 4,691,198, Cl. 340-649.000.
Mortier, Guy; and Chartrain, Jean-Claude, to Souriau & Cie. Device for making inside grooves in hollow parts. 4,690,596, Cl. 409-143.000.
Morton, Gerald H.: *See*—
Gardner, John F.; and Morton, Gerald H., 4,690,164, Cl. 137-15.000.
Moscovici, Poldi, to Superior Manufacturing & Instrument Corporation. Current fed inverter. 4,691,275, Cl. 363-143.000.
Mosmann, Tim R., to DNAX Research Institute of Molecular and Cellular Biology, Inc. Hybridoma cell lines producing monoclonal antibodies which specifically bind to mouse interleukin-2. 4,690,893, Cl. 435-240.270.
Mosse, Madeleine: *See*—
Demarne, Henri; Filhol, Robert; and Mosse, Madeleine, 4,691,043, Cl. 560-064.000.
Motalov, Alexandr N.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.
Motegi, Nawoto; Watanabe, Yukio; Shimada, Naohiro; and Okajima, Masaki, to Kabushiki Kaisha Toshiba. Semiconductor laser device having current confining and built-in waveguide structure. 4,691,321, Cl. 372-46.000.
Motorola, Inc.: *See*—
Blum, Stephen C.; and Deriso, John, 4,691,179, Cl. 333-202.000.
Ecklund, Lawrence M., 4,691,175, Cl. 331-1.00A.
Ledzius, Robert C.; and Allen, Steven P., 4,691,124, Cl. 307-303.000.
Marabotto, Eduardo J.; and Bresin, Mark S., 4,690,471, Cl. 439-63.000.
Pelley, Perry H., III; and Lewandowski, Alan, 4,691,300, Cl. 365-200.000.
Rybicki, Mathew A., 4,691,125, Cl. 307-353.000.
Moulding, Thomas S., Jr.; and Ellis, Donald G. Method of opening a medicine package. 4,690,676, Cl. 604-189.000.
Mowinski, Josephine A.: *See*—
Manning, Thomas J.; Ritzert, Jack L.; Blouin, Joseph D.; and Mowinski, Josephine A., 4,690,435, Cl. 285-256.000.
Mrenna, Stephen A.; and Whipple, Michael J., to Westinghouse Electric Corp. Circuit breaker with adjustable magnetic trip unit. 4,691,182, Cl. 335-176.000.
M'Timkulu, Thabiso: *See*—
Loor, Rueyming; M'Timkulu, Thabiso; and DeWitt, Susanne K., 4,690,890, Cl. 435-7.000.

MTS Systems Corporation: *See*—
Harvey, Dennis N.; and Bertolasi, Robert B., 4,690,001, Cl. 73-800.000.
Muck, Manfred; Blanc, Walter; and Muller, Hans-Albert, to Blanc GmbH & Company. Built-in sink. 4,689,840, Cl. 4-629.000.
Mueller Co.: *See*—
Daghe, Joseph L.; Humes, Dennis W.; Stanley, Mervin D.; and Bouc, Gary L., 4,690,019, Cl. 81-99.000.
Muir, Malcolm D.: *See*—
McAlevey, Richard J.; Muir, Malcolm D.; and van der Laan, Johan S., 4,691,345, Cl. 379-158.000.
Mukai, Hiromu: *See*—
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, 4,690,536, Cl. 354-402.000.
Mukaida, Yoshito: *See*—
Okita, Tsutomu; Tsuji, Nobuo; Hashimoto, Hiroshi; and Mukaida, Yoshito, 4,690,870, Cl. 428-425.900.
Mullen, George B.: *See*—
Georgiev, Vassil S.; and Mullen, George B., 4,691,051, Cl. 562-443.000.
Muller, Erich: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,690,923, Cl. 514-222.000.
Muller, Hans-Albert: *See*—
Muck, Manfred; Blanc, Walter; and Muller, Hans-Albert, 4,689,840, Cl. 4-629.000.
Mulvaney, Lewis W., to R. Neumann & Co. Partially detackified leather and glove. 4,689,832, Cl. 2-161.00A.
Munyon, Gary D.; and Swiech, Matthew J., to G & B Rubber Stamp Co., Inc. Roller stamp construction. 4,690,053, Cl. 101-328.000.
Murakami, Gen; and Gappa, Takeshi, to Hitachi, Ltd. Semiconductor device and a method of producing the same. 4,691,225, Cl. 357-80.000.
Murakami, Susumu; Kagami, Teruyuki; Yatsuo, Tsutomu; and Takahashi, Masaaki, to Hitachi, Ltd. Semiconductor device having high breakdown voltage. 4,691,223, Cl. 357-51.000.
Murakami, Yukiyasu: *See*—
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.
Murata Manufacturing Co., Ltd.: *See*—
Murata, Michihiro; Tanaka, Katsuhiko; and Seto, Hiroyuki, 4,691,104, Cl. 250-338.000.
Yoshio, Arakawa, 4,691,266, Cl. 361-433.000.
Murata, Michihiro; Tanaka, Katsuhiko; and Seto, Hiroyuki, to Murata Manufacturing Co., Ltd. One-dimensional pyroelectric sensor array. 4,691,104, Cl. 250-338.000.
Murata, Syuuji: *See*—
Sogabe, Ichita; Murata, Syuuji; and Yokoya, Yuji, 4,691,135, Cl. 310-254.000.
Murata, Toyoji: *See*—
Toki, Masahisa; Satoh, Seiji; Matsui, Yoshiaki; Morihata, Kunio; and Murata, Toyoji, 4,689,944, Cl. 57-260.000.
Murate, Shigenori; and Hattori, Yoshinori, to NGK Spark Plug Co., Ltd. Process of contouring the edges of a ceramic rotor. 4,689,921, Cl. 51-317.000.
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, to Hitachi, Ltd. Scroll-type fluid machine with configured wrap edges and grooves. 4,690,625, Cl. 418-55.000.
Murayama, Kimimasa: *See*—
Fukuma, Nobuo; Hasegawa, Hisayasu; Murayama, Kimimasa; Hayashi, Kunio; and Tokudome, Yoshihiro, 4,689,864, Cl. 29-157.10R.
Murchie, John R.: *See*—
Schad, Robert D.; Rees, Herbert; Hughes, Gary; and Murchie, John R., 4,690,633, Cl. 425-526.000.
Muroya, Minoru: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Shiina, Takanori; Matsumoto, Yukihiro; and Muroya, Minoru, 4,690,121, Cl. 123-589.000.
Murphy, Betty J.: *See*—
Smith, James A.; and Murphy, Betty J., 4,690,821, Cl. 424-401.000.
Murphy, Lawrence M., to United States of America, Energy. Energy conversion system. 4,691,075, Cl. 136-246.000.
Murphy, Richard D.; and Fischer, William C., to United Technologies Corporation. Backup control system (BUCS). 4,691,315, Cl. 371-9.000.
Musa, Yoshikazu: *See*—
Ninomiya, Yasuo; Komamura, Chiaki; and Musa, Yoshikazu, 4,690,786, Cl. 264-4.600.
Muto, Shigeaki: *See*—
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.
Myers, John P.: *See*—
Huhndorff, Harry R.; and Myers, John P., 4,690,879, Cl. 429-61.000.
Myotoku Ltd.: *See*—
Kato, Minoru, 4,690,594, Cl. 408-159.000.
Myson Heating Limited: *See*—
Halstead, Christopher, 4,690,129, Cl. 126-85.00B.
N I Industries: *See*—
Choate, Paul V.; and Woodburn, Robert W., 4,689,910, Cl. 42-100.000.
N.K.F. Groep B.V.: *See*—
Laugs, Johannis A. B.; Van Den Berg, Gerrit; Van Daalen, Peter A.; and Reinders, Edward D., 4,690,718, Cl. 156-48.000.
Nafziger, Steven: *See*—
McNennamy, John A.; and Nafziger, Steven, 4,690,003, Cl. 73-862.320.
Nagai, Kayoko; and Tsubuko, Kazuo, to Ricoh Co., Ltd. Liquid developer for electrophotography. 4,690,881, Cl. 430-114.000.
Nagano, Fumikazu, to Sharp Kabushiki Kaisha. Image reader. 4,691,228, Cl. 358-75.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Speed control device. 4,690,662, Cl. 474-69.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Rear derailleur for a bicycle. 4,690,663, Cl. 474-80.000.
Nagano, Noriaki: *See*—
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.
Nagano, Shuji; Ida, Shuichiro; Yoshinaka, Toshio; and Okuda, Shozo, to Toyota Jidosha Kabushiki Kaisha. Power transfer device for automotive vehicles. 4,690,015, Cl. 74-665.0GE.
Nagaoka, Yoshitomi: *See*—
Nakajima, Yasuo; Yamamoto, Yoshiharu; Miyatake, Yoshito; Nagaoka, Yoshitomi; and Ono, Shusuke, 4,690,515, Cl. 350-432.000.
Nagase, Yasuo: *See*—
Kizu, Shuji; Ishida, Tsuyoshi; and Nagase, Yasuo, 4,691,100, Cl. 250-223.00R.
Nagashima, Masayasu; and Iijima, Nobuo, to Fujitsu Limited. Method and apparatus for transporting an article in vacuum. 4,690,591, Cl. 406-88.000.
Nagashima, Nao, to Canon Kabushiki Kaisha. Image reading apparatus. 4,691,365, Cl. 382-54.000.
Naito, Takanobu; Yokoyama, Masaaki; Sasaki, Kazuya; Yamamoto, Makoto; and Amemiya, Kouji, to Kaken Pharmaceutical Co., Ltd. Cephalosporin compounds. 4,691,014, Cl. 540-227.000.
Nakada, Takao, to Hitachi Chemical Co., Ltd. Zirconia ceramics and process for producing the same. 4,690,911, Cl. 501-105.000.
Nakada, Yasuo, to Sony Corporation. Apparatus for detecting distance to an object. 4,690,549, Cl. 356-4.000.
Nakagaki, Shintaro: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; and Kuriyama, Takashi, 4,691,227, Cl. 358-47.000.
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, to Yamaguchikyoei Industry Co. Ltd. Water cooled scrap preheating bucket. 4,690,638, Cl. 432-81.000.
Nakagawa, Taizo: *See*—
Yoshida, Hiroshi; Konishi, Kenji; Koike, Kengo; Nakagawa, Taizo; Shimano, Shizuo; and Mochizuki, Seiji, 4,690,934, Cl. 514-354.000.
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, to Minolta Camera Kabushiki Kaisha. Exposure control device for a camera in flash photography. 4,690,536, Cl. 354-402.000.
Nakai, Masaaki: *See*—
Fujino, Akihiko; Inoue, Manabu; Nakai, Masaaki; and Sekida, Minoru, 4,690,530, Cl. 354-21.000.
Nakajima, Kunihiro: *See*—
Sato, Akihiko; Noto, Akira; Morita, Fumiaki; and Nakajima, Kunihiro, 4,690,819, Cl. 424-88.000.
Nakajima, Takeshi, to NEC Corporation. Battery saving signal generating circuit. 4,691,382, Cl. 455-343.000.
Nakajima, Yasuo; Yamamoto, Yoshiharu; Miyatake, Yoshito; Nagaoka, Yoshitomi; and Ono, Shusuke, to Matsushita Electric Industrial Co., Ltd. Compact projection lens. 4,690,515, Cl. 350-432.000.
Nakamatsu, Toshio; Matsuo, Yoshikazu; Nishikuri, Masao; and Imada, Kunihiko, to Sumitomo Chemical Company, Limited. Light-fast yellow disperse dye composition for polyester. 4,690,686, Cl. 8-638.000.
Nakamura, Hitoshi; Kaneko, Yujiro; Sawada, Yasuo; Machida, Hajime; Omi, Fumiya; and Watada, Atsuyuki, to Ricoh Co., Ltd. Magneto optical recording medium. 4,690,861, Cl. 428-623.000.
Nakamura, Ikushi, to Minolta Camera Kabukishi Kaisha. Battery power detector for sensing presence of batteries. 4,690,878, Cl. 429-1.000.
Nakamura, Kazuyoshi: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.
Nakamura, Kousuke: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hirosi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio, 4,690,793, Cl. 376-136.000.
Nakamura, Takayoshi, to Kabushiki Kaisha Kito. Electric chain block. 4,690,379, Cl. 254-347.000.
Nakamura, Teiji; Nishikawa, Eiichiro; and Koyama, Takeo, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst, its method of preparation and process for its use in the hydrogenation of diolefins. 4,691,070, Cl. 585-273.000.
Nakano, Jiro, to Fanuc Ltd. Stator laminate impregnation in a liquid-cooled motor. 4,691,131, Cl. 310-54.000.

Nakano, Kohji: *See*—
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.
Nakano, Masaji: *See*—
Fukamizu, Hiroshi; Nakano, Masaji; Iba, Kunio; Yamasaki, Taro; and Sano, Kenji, 4,690,553, Cl. 356-51.000.
Nakano, Shigeo: *See*—
Yamauchi, Fumio; Tohara, Tsutomu; Nakano, Shigeo; and Emoto, Shigeo, 4,690,960, Cl. 523-442.000.
Nakaoka, Junichi: *See*—
Wada, Toshiaki; Katsuyama, Yoshiaki; and Nakaoka, Junichi, 4,690,846, Cl. 428-64.000.
Nakashima, Tai: *See*—
Funabashi, Katsunori; Nakashima, Tai; Yamada, Toshiyuki; and Morishima, Kazuo, 4,690,237, Cl. 180-219.000.
Nakatani, Hiroshi: *See*—
Takamatsu, Toshiaki; Kuwagaki, Hiroshi; Minezaki, Shigehiro; Yamamoto, Kunihiko; Nakatani, Hiroshi; and Kawaguchi, Hisao, 4,690,510, Cl. 350-334.000.
Nakatani, Masayuki: *See*—
Makino, Hiroshi; and Nakatani, Masayuki, 4,690,873, Cl. 428-473.500.
Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,690,699, Cl. 55-267.000.
Nakatani, Shuichi: *See*—
Nakayama, Hideo; Nakatani, Shuichi; Tanaka, Fusatoshi; and Hanafusa, Hiroyuki, 4,690,106, Cl. 123-52.00M.
Nakayama, Hideo; Nakatani, Shuichi; Tanaka, Fusatoshi; and Hanafusa, Hiroyuki, to Mazda Motor Corporation. Intake system for internal combustion engine. 4,690,106, Cl. 123-52.00M.
Nakayama, Takeshi: *See*—
Terada, Yasuhi; and Nakayama, Takeshi, 4,691,216, Cl. 357-23.600.
Nakayama, Wataru: *See*—
Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Oizumi, Kiyoshi, 4,690,211, Cl. 165-177.000.
Nakayama, Yoshiaki: *See*—
Okada, Kazuo; and Nakayama, Yoshiaki, 4,691,252, Cl. 360-75.000.
Nakayama, Yusho: *See*—
Otsuka, Nobuyuki; Kasuya, Atsuo; Nakayama, Yusho; Kumashiro, Masayuki; Furuya, Tamio; and Kaiho, Shigeo, 4,689,979, Cl. 72-57.000.
Namdari, Bahram. Nutcracker. 4,690,048, Cl. 99-575.000.
Nanba, Yukihiro; and Sakakibara, Toshiyuki, to Nippon Fine Chemical Co., Ltd. Process for preparing phosphatidylcholine derivatives. 4,690,784, Cl. 260-403.000.
Naoe, Masahiko; and Ishibashi, Shozo, to Konishiroku Photo Industry Co., Ltd. Method of ion beam generation and an apparatus based on such method. 4,690,744, Cl. 204-192.110.
Napco Industries, Inc.: *See*—
White, Bernard C., 4,689,911, Cl. 42-105.000.
Narahara, Toshikazu: *See*—
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.
Narang, Rajendra K. Clothes dryer and laundry system. 4,689,896, Cl. 34-82.000.
Nardi, Alain; and Simier, Jean-Noel, to Societe Chimique des Charbonnages-CdF chimie. Process for reducing the chances of ignition and explosion due to the decomposition of high-pressure industrial process gases. 4,690,800, Cl. 422-40.000.
Narisawa, Nobuyuki: *See*—
Kimura, Shigehiro; Ono, Takashi; and Narisawa, Nobuyuki, 4,690,123, Cl. 123-612.000.
Naritomi, Yasuhisa; Takahashi, Hiroshi; and Shiba, Keisuke, to Fuji Photo Film Co., Ltd. Method for making negative working O-quinone diazide containing dry planographic printing plate utilizing multiply light exposure, development and basic treatment. 4,690,886, Cl. 430-303.000.
Narr, Berthold: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,690,923, Cl. 514-222.000.
Narumiya, Yoshikazu; Hashimoto, Yasuo; Yui, Hiroshi; and Kageyama, Yoshiteru, to TDK Corporation. Electromagnetic shielding material. 4,690,778, Cl. 252-506.000.
Narutani, Tetsu; and Suzuki, Shigeharu, to Kawasaki Steel Corporation. Ultrasoft stainless steel. 4,690,798, Cl. 420-61.000.
Nathan, Vaidy R.; Wang, John T.; and Downes, James E., to Monsanto Company. Process for the preparation of asbestiform crystalline calcium sodium metaphosphate fibers. 4,690,809, Cl. 423-306.000.
National Dairy Association of N.Z., The: *See*—
Gregan, David J.; and Crowter, Ronald H., 4,690,099, Cl. 119-14.410.
National Gypsum Company: *See*—
Menchetti, Robert J., 4,689,930, Cl. 52-277.000.
National Medical Care: *See*—
Tell, Elaine N.; and Veltman, Preston L., 4,690,772, Cl. 252-106.000.
National Research Development Corporation: *See*—
Ibrahim, Ibrahim N.; and Sansome, Dennis H., 4,689,981, Cl. 72-150.000.
McGeehan, Joseph P.; and Bateman, Andrew, 4,691,375, Cl. 455-71.000.
National Starch and Chemical Corporation: *See*—
Shih, Yen-Jer; Tsai, John (Ji-Hsiung); Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., 4,690,996, Cl. 527-312.000.
Naudin, Jacky, to Valeo. Clutch cover assembly. 4,690,259, Cl. 192-70.280.
NCR Corporation: *See*—
Jen, Tai-Kuang, 4,691,150, Cl. 318-331.000.
Kleijne, Theodoor A.; and Goossens, Jan B., 4,691,350, Cl. 380-3.000.
Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, to Jenoptik Jena GmbH. Laser spectral fluorometer. 4,691,110, Cl. 250-458.100.
NEC Corporation: *See*—
Furui, Toshiyuki, 4,691,281, Cl. 364-200.000.
Iwata, Jun, 4,691,278, Cl. 364-200.000.
Makino, Masayuki, 4,691,338, Cl. 379-61.000.
Nakajima, Takeshi, 4,691,382, Cl. 455-343.000.
Shizume, Yasumichi, 4,691,379, Cl. 455-319.000.
Tanigaki, Katsumi; and Iida, Yasuo, 4,690,882, Cl. 430-192.000.
Yoshihara, Masashi; and Yano, Kazuo, 4,691,377, Cl. 455-256.000.
Nee, John D.; and Hahn, Joseph J., to Westinghouse Electric Corp. Tool for cutting locking cups from guide tube mounting screws in a nuclear reactor. 4,690,593, Cl. 408-80.000.
Nelson, Carib: *See*—
Uken, William D.; Dubrow, Robert S.; Nelson, Carib; and Dittmer, Catherine A., 4,690,831, Cl. 427-44.000.
Nelson, Jack: *See*—
Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Holloway, Gerald C., Jr.; and Nelson, Jack, 4,690,665, Cl. 474-245.000.
Nelson, Mark R.: *See*—
Jencks, David R.; and Nelson, Mark R., 4,690,126, Cl. 126-77.000.
Nelson, Martin N.; and Rough, J. Kirkwood H. Dynamic video system and method. 4,691,239, Cl. 358-282.000.
Nelson, Richard V.; and Stephen, John F., to ICI Americas Inc. Tartrate-based light stabilizers for plastics. 4,690,963, Cl. 524-98.000.
Nelson, Theodore G.; and Diller, Calvin D., to Tektronix, Inc. Fast recovery amplifier. 4,691,174, Cl. 330-260.000.
Nerone, Louis R.: *See*—
Kuwata, Yutaka; and Nerone, Louis R., 4,691,273, Cl. 363-132.000.
Neste Oy: *See*—
Seppala , Jukka, 4,690,991, Cl. 526-158.000.
Nestor, John J., Jr.; and Vickery, Brian, to Syntex (U.S.A.) Inc. Nona and decapeptide analogs of LHRH useful as LHRH antagonists. 4,690,916, Cl. 514-15.000.
Neulinger, Franz: *See*—
Alig, Franz; Bocker, Heinrich; Neulinger, Franz; and Schummer, Helmut, 4,690,694, Cl. 55-4.000.
Neumann, Bruno: *See*—
Maier, Helmut; Neumann, Bruno; and Schaafhausen, Ludwig R., 4,690,582, Cl. 403-252.000.
Neustadt, Bernard R.: *See*—
Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,691,049, Cl. 562-553.000.
New Japan Radio Co., Ltd.: *See*—
Watanabe, Hiroshi; Johzuka, Takashi; and Suzuki, Masanobu, 4,691,376, Cl. 455-131.000.
Newman, Donald J.: *See*—
Dunphy, Gerald F.; and Newman, Donald J., 4,689,975, Cl. 70-56.000.
Newport Corporation: *See*—
Zimmermann, Micha, 4,690,507, Cl. 350-321.000.
Neyer, Antonius A., to U.S. Philips Corp. Integrated optical wavelength multiplexer and demultiplexer device for monomode transmission systems and its use. 4,690,489, Cl. 350-96.140.
Ng, Johny S., to Occidental Chemical Corporation. Catalytic process for coupling telomers of chlorotrifluoroethylene. 4,691,067, Cl. 570-153.000.
NGK Insulators, Ltd.: *See*—
Oda, Isao; and Tsuno, Nobuo, 4,690,617, Cl. 416-241.00B.
NGK Spark Plug Co., Ltd.: *See*—
Kato, Norio; Nozaki, Shunkichi; Kimura, Yukihiro; and Kambe, Rokuro, 4,690,872, Cl. 428-446.000.
Murate, Shigenori; and Hattori, Yoshinori, 4,689,921, Cl. 51-317.000.
Okuno, Akiyasu; and Watanabe, Masakazu, 4,690,909, Cl. 501-90.000.
Nicator AB: *See*—
Wiklund, Klas R., 4,690,557, Cl. 356-155.000.
Nichias Corporation: *See*—
Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, 4,690,867, Cl. 428-367.000.
Nicholls, Robin P.; and Savoie, Rolland J. Control circuit for electric vehicles. 4,691,148, Cl. 318-12.000.
Nichols, James H., Jr.: *See*—
Zebley, Raymond S.; Nichols, James H., Jr.; and Ciosek, Bernard M., Jr., 4,690,302, Cl. 221-11.000.
Nickl, Josef: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,690,923, Cl. 514-222.000.
Nicolas, Michel: *See*—
Bouteille, Daniel; Nicolas, Michel; and Guillin, Daniel, 4,690,035, Cl. 91-442.000.

Nieh, Edward C. Y.: *See*—
Duranleau, Roger G.; Nieh, Edward C. Y.; and Knifton, John F., 4,691,041, Cl. 558-277.000.

Nielsen, Steven T. Centrifuge tube having reusable seal. 4,690,670, Cl. 494-16.000.

Nienburg, Hans: *See*—
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.0SC.

Niggemann, Richard; and Readman, John, to Sundstrand Corporation. Fluid jet impingement heat exchanger for operation in zero gravity conditions. 4,690,210, Cl. 165-159.000.

Nihon Sanmo Dyeing Co., Ltd.: *See*—
Tomibe, Shinji; Gomibuchi, Reizo; Takahashi, Kiyofumi; and Kato, Noboru, 4,690,854, Cl. 428-195.000.

Niimura, Koichi: *See*—
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.

Niinuma, Akira: *See*—
Oba, Hiroki; Aoki, Seiichi; Niinuma, Akira; and Sato, Seiichiro, 4,690,484, Cl. 439-736.000.

Nikawa, Yoshio: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,690,156, Cl. 128-804.000.

Nikov, Nikolay Y.: *See*—
Garlanov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.

Niles Parts Co., Ltd.: *See*—
Katsutani, Kazuji; and Inaba, Shigeru, 4,691,181, Cl. 335-128.000.

Nimura, Takao: *See*—
Fujiwhara, Mitsuto; Nimura, Takao; Numata, Yasumasa; and Matsubara, Yasuko, 4,690,888, Cl. 430-549.000.

Ninomiya, Yasuo; Komamura, Chiaki; and Musa, Yoshikazu, to Nitto Electric Industrial Co., Ltd. Process for producing a microcapsule containing a liquid active material. 4,690,786, Cl. 264-4.600.

Nippon Electric Co., Ltd.: *See*—
Yamauchi, Fumio; Tohara, Tsutomu; Nakano, Shigeo; and Emoto, Shigeo, 4,690,960, Cl. 523-442.000.

Nippon Fine Chemical Co., Ltd.: *See*—
Nanba, Yukihiro; and Sakakibara, Toshiyuki, 4,690,784, Cl. 260-403.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Yoshida, Hiroshi; Konishi, Kenji; Koike, Kengo; Nakagawa, Taizo; Shimano, Shizuo; and Mochizuki, Seiji, 4,690,934, Cl. 514-354.000.

Nippon Kogaku K. K.: *See*—
Fujie, Daijiro, 4,690,517, Cl. 350-458.000.
Kanno, Hideo, 4,690,516, Cl. 350-444.000.
Kato, Kinya; and Tsuchiya, Hiroyuki, 4,690,565, Cl. 356-446.000.
Takagi, Akihiro; and Kimoto, Kiyoshi, 4,691,308, Cl. 369-13.000.
Tanimoto, Akikazu; and Imamura, Kazunori, 4,690,528, Cl. 353-101.000.
Wakabayashi, Hiroshi; and Kazami, Kazuyuki, 4,690,533, Cl. 354-173.110.

Nippon Light Metal Co., Ltd.: *See*—
Yoshida, Katunori, 4,690,247, Cl. 182-63.000.

Nippon Rubber Co. Ltd.: *See*—
Ishibashi, Tokujiro, 4,689,900, Cl. 36-103.000.

Nippon Shokubai Kagaku Co., Ltd.: *See*—
Fukuchi, Shuzo; and Yamaguchi, Shigeru, 4,691,045, Cl. 560-185.000.

Nippon Soken, Inc.: *See*—
Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.
Takeda, Kenji; Inagaki, Mitsuo; Sasaya, Hideaki; and Matsui, Kazuma, 4,690,465, Cl. 303-119.000.
Yoshino, Yasuhisa; and Osada, Masahiko, 4,691,361, Cl. 381-81.000.

Nippon Telegraph and Telephone Corporation: *See*—
Fukuda, Mitsutoshi; Fukutomi, Makoto; Kogure, Osamu; and Miyoshi, Kazunori, 4,690,887, Cl. 430-331.000.
Kuwata, Yutaka; and Nerone, Louis R., 4,691,273, Cl. 363-132.000.

Nippondenso Co., Ltd.: *See*—
Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.
Sasakura, Hachirou; and Tsujimura, Masakuni, 4,690,122, Cl. 123-609.000.
Sogabe, Ichita; Murata, Syuuji; and Yokoya, Yuji, 4,691,135, Cl. 310-254.000.
Takeda, Kenji; Inagaki, Mitsuo; Sasaya, Hideaki; and Matsui, Kazuma, 4,690,465, Cl. 303-119.000.
Yamaguchi, Yoshimitsu; Shibata, Tadahiko; Suzuki, Masanori; and Toda, Takezi, 4,690,349, Cl. 242-75.500.

Nirenberg, Morris. Button delivery system for sewing machines. 4,690,077, Cl. 112-113.000.

Nisato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, to Sanofi. Anorectic agent; 4-(3-trifluoromethylphenyl)-1-(2-cyanoethyl)-1,2,3,6-tetrahydropyridine. 4,691,019, Cl. 546-330.000.

Nishida, Isamu: *See*—
Odagiri, Hiroshi; and Nishida, Isamu, 4,690,568, Cl. 368-204.000.

Nishida, Yoshihiro: *See*—
Ookawa, Katsuhiro; Fujii, Toshifumi; and Nishida, Yoshihiro, 4,691,251, Cl. 360-14.100.

Nishiguchi, Yasuo; Yasutomi, Tsuyoshi; and Shiraishi, Ryoichi, to Kyocera Corporation. Thermal head for heat-sensitive recording. 4,691,210, Cl. 346-76.0PH.

Nishikawa, Eiichiro: *See*—
Nakamura, Teiji; Nishikawa, Eiichiro; and Koyama, Takeo, 4,691,070, Cl. 585-273.000.

Nishikuri, Masao: *See*—
Nakamatsu, Toshio; Matsuo, Yoshikazu; Nishikuri, Masao; and Imada, Kunihiko, 4,690,686, Cl. 8-638.000.

Nishimoto, Naomichi, to Victor Company of Japan. Synchronized signal separating circuit for a recording and reproducing apparatus. 4,691,248, Cl. 358-320.000.

Nishimura, Hirofumi; and Morita, Yasuyuki, to Mazda Motor Corporation. Variable valve mechanism for internal combustion engines. 4,690,110, Cl. 123-90.170.

Nishimura, Makoto, to Tokiko, Ltd. Method of controlling positioning of rotor of stepping motor. 4,691,153, Cl. 318-696.000.

Nishimura, Toshio, to Sharp Kabushiki Kaisha. Solar power circuit. 4,691,118, Cl. 307-66.000.

Nishimura, Yasuyuki: *See*—
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, 4,691,053, Cl. 562-531.000.

Nishina, Kiichiro: *See*—
Kouchiwa, Taira; and Nishina, Kiichiro, 4,690,518, Cl. 350-464.000.

Nishina, Shingo, to Mitutoyo Mfg., Co., Ltd. Digital display measuring apparatus. 4,689,890, Cl. 33-504.000.

Nishioka, Tadashi; Koyama, Hiroshi; and Mashiko, Yoji, to Mitsubishi Denki Kabushiki Kaisha. Aluminum circuit to be disconnected and method of cutting the same. 4,691,078, Cl. 174-68.500.

Nishiura, Masaharu, to Fuji Electric Company, Ltd. Process for fabricating a thin-film solar battery. 4,689,874, Cl. 437-2.000.

Nishiyama, Masao; and Hirano, Yasuo, to Allied Corporation. Copolymerization of lactam with diene polymer having amino or imino end groups. 4,691,004, Cl. 528-323.000.

Nishiyama, Michio: *See*—
Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, 4,690,867, Cl. 428-367.000.

Nishiyama, Tadashi: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitagu, 4,690,788, Cl. 264-22.000.

Niskin, Shale J.; and Williams, Gerald J., to General Oceanics, Inc. Sheave assembly with multiple pulleys used to measure cable angle. 4,690,380, Cl. 254-394.000.

Nissan Motor Company Limited: *See*—
Higashiyama, Kazuhiro, 4,690,124, Cl. 123-643.000.
Ito, Ken; and Inoue, Naohiko, 4,690,431, Cl. 280-771.000.
Sasaki, Masafumi, 4,690,572, Cl. 384-120.000.
Takahashi, Nobutaka, 4,690,116, Cl. 123-425.000.
Takeda, Hitoshi, 4,691,285, Cl. 364-424.100.

Nissho Iwai American Corporation: *See*—
Timineri, Anthony A., 4,691,207, Cl. 343-766.000.

Nitta, Tomio, to Tokai Corporation. High-pressure gas filling valve for use in a pressure resistant container. 4,690,377, Cl. 251-354.000.

Nitto Chemical Industry Co., Ltd: *See*—
Sekimoto, Yukihiko; Yanagita, Makoto; and Kanda, Shoichi, 4,691,013, Cl. 536-96.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Ninomiya, Yasuo; Komamura, Chiaki; and Musa, Yoshikazu, 4,690,786, Cl. 264-4.600.
Oka, Hiroyuki; Akasaka, Shinichi; Ohara, Shuichi; Hattori, Shintaroo; Mori, Yasuki; Narahara, Toshikazu; and Matsumoto, Hiroshi, 4,690,858, Cl. 428-216.000.

Niwa, Toshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Sliding roof for vehicles. 4,690,452, Cl. 296-216.000.

Niwa, Toshiaki, to Honda Giken Kogyo Kabushiki Kaisha. Sliding roof for vehicles. 4,690,453, Cl. 296-216.000.

NL Industries, Inc.: *See*—
Bhatia, Kishan; and Garcia, John G., Jr., 4,690,805, Cl. 423-224.000.

Nobuhara, Uichi, to Kabushiki Kaisha Kumalift Gijutsu Kenkyusho. Automatic transfer apparatus for elevators. 4,690,611, Cl. 414-661.000.

Noishiki, Yasuharu; Kodaira, Kazuhiko; Furuse, Masayasu; Miyata, Teruo; Miyamoto, Takeaki; and Ito, Hiraku, to Koken Company Limited. Production process of an antithrombogenic and antiadhesive material for medical use. 4,690,973, Cl. 525-54.100.

Nojiri, Naohiro; and Sakai, Yukio, to Mitsubishi Petrochemical Co., Ltd. Silver catalyst for production of ethylene oxide from ethylene and process for producing the catalyst. 4,690,913, Cl. 502-340.000.

Nomix Manufacturing Co. Limited: *See*—
Gill, David C., 4,690,326, Cl. 239-223.000.

Nomura, Hiroshi: *See*—
Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, 4,690,619, Cl. 417-269.000.

Nomura, Kenji: *See*—
Tanji, Hiroaki; Suzuki, Masaharu; Nomura, Kenji; Watanabe, Shojiro; and Kawasaki, Takashi, 4,690,841, Cl. 428-35.000.

Nomura, Takao: *See*—
Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, 4,690,764, Cl. 210-629.000.

Nonaka, Hikaru, to Kabushiki Kaisha Toshiba. Refrigeration having mode-change chamber capable of operation within freezing, chill and refrigeration temperature ranges. 4,689,966, Cl. 62-187.000.

Noren, Gerry K.: *See*—
Zimmerman, John M.; Noren, Gerry K.; and Bishop, Timothy E., 4,690,501, Cl. 350-96.290.
Norimatsu, Kohji: *See*—
Funahashi, Masaya; Miyata, Teruhisa; Inoue, Kenichi; Miyake, Akira; and Norimatsu, Kohji, 4,690,864, Cl. 428-336.000.
North American Philips Corporation: *See*—
Mayo, William T., Jr., 4,690,150, Cl. 128-660.000.
Northern Telecom Limited: *See*—
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Nukem GmbH: *See*—
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Frick, Willy; Meyer, Alfred; and Nyfeler, Robert, 4,690,942, Cl. 514-383.000.
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Isobe, Toshiaki; and Oba, Hidehiro, 4,690,117, Cl. 123-492.000.
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Johnson, Timothy W.; Beever, William H.; O'Connor, James E.; and Blackwell, Jennings P., 4,690,972, Cl. 524-609.000.
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Vernikov, Arkady Y.; Gamarnik, Iosif I.; Rashkovich, Mikhail P.; Trostanovsky, Boris A.; and Khinkus, Alexandr S., 4,691,183, Cl. 335-289.000.
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Thalmann, Theo; and Oesterle, Gerhard, 4,690,176, Cl. 139-110.000.
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Dunphy, Gerald F.; and Newman, Donald J., 4,689,975, Cl. 70-56.000.
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Tsunoyama, Kouzou; Ohashi, Yoshiharu; Furunushi, Yasuko; and Konishi, Motoyuki, 4,690,558, Cl. 356-318.000.
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Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,690,932, Cl. 514-337.000.
Ohba, Masaru: *See*—
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Stevens, Vernon C., 4,691,006, Cl. 530-324.000.
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Ohno, Shotaro: *See*—
Koyama, Kenji; and Ohno, Shotaro, 4,690,754, Cl. 210-94.000.
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Ohta, Yukio: *See*—
Kikuchi, Hiroshi; Watanabe, Shyoichi; and Ohta, Yukio, 4,690,577, Cl. 400-708.000.
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Kumamoto, Kenichiro; Sato, Akira; Ohya, Koichi; and Matsuda, Koichi, 4,691,378, Cl. 455-301.000.
Oizumi, Kiyoshi: *See*—
Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Oizumi, Kiyoshi, 4,690,211, Cl. 165-177.000.
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Terae, Nobuyuki; Yamaya, Masaaki; and Okada, Fumio, 4,690,713, Cl. 106-287.160.
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Okada, Yoshinori: *See*—
Miura, Kuniaki; Okada, Yoshinori; Fukushima, Isao; and Otsuka, Susumu, 4,691,246, Cl. 358-310.000.
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Okhuma, Toshiaki: *See*—
Uemura, Toshinobu; Okhuma, Toshiaki; Shinooka, Kiyohide; Ishikuro, Hiroshi; and Ueda, Yoshio, 4,690,822, Cl. 424-455.000.
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Kikuchi, Hiroshi; Watanabe, Shyoichi; and Ohta, Yukio, 4,690,577, Cl. 400-708.000.
Morito, Makoto, 4,691,359, Cl. 381-51.000.
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Oksuzler, Yalcin, to Mobil Oil Corporation. Method and apparatus for positioning an offshore platform jacket. 4,690,586, Cl. 405-209.000.
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Okumura, Munehiro; Nomura, Takao; Matsuda, Tadashi; Kido, Shojiro; Ishii, Shinichi; and Hattori, Hideki, to Mitsubishi Rayon Engineering Co., Ltd. Aerator and aerobic biological treatment process using same. 4,690,764, Cl. 210-629.000.
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Matsuda, Hitoshi; Okumura, Tsuguo; and Abe, Kazuharu, 4,690,792, Cl. 264-235.800.
Okuno, Akiyasu; and Watanabe, Masakazu, to NGK Spark Plug Co., Ltd. Silicon carbide-graphite composite material and process for producing same. 4,690,909, Cl. 501-90.000.
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Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,690,780, Cl. 252-572.000.
Oliver, Larry R.; Hill, James D., Jr.; Lewis, Charles M.; Hollaway, Gerald C., Jr.; and Nelson, Jack, to Dayco Products, Inc. Chain belt construction, load block therefor and methods for making the same. 4,690,665, Cl. 474-245.000.
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Goudeaux, James L.; and Olivier, Eric J., 4,689,923, Cl. 51-410.000.
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Olson, Theodore D., Jr. Precisely recurrently controllable dropwise liquid-feeders. 4,690,249, Cl. 184-6.400.
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Fukamizu, Hiroshi; Nakano, Masaji; Iba, Kunio; Yamasaki, Taro; and Sano, Kenji, 4,690,553, Cl. 356-51.000.
Kiyono, Yasuhiro; and Takeyama, Yutaka, 4,691,116, Cl. 307-10.00R.
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Yamada, Yosuke; and Oogami, Mitsuhiro, 4,690,158, Cl. 134-107.000.
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Chapman, Robert E., 4,690,186, Cl. 144-176.000.
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Angermann, Gottfried; and Hiebl, Berthold, 4,689,838, Cl. 2-441.000.
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Jencks, David R.; and Nelson, Mark R., 4,690,126, Cl. 126-77.000.
Orr, Robert B.; and Chicosky, Leon, Jr., to Seton Company. Method of frothing aqueous ionic polyurethane dispersions and products produced therefrom. 4,690,953, Cl. 521-65.000.
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Kung, Patrick C.; and Goldstein, Gideon, 4,691,010, Cl. 530-387.000.
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Castagna, Wolfgang; Krankenhagen, Jochen; Ortwein, Heinz; and Weertz, Klaus, 4,690,081, Cl. 112-276.000.
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Kawakita, Takao; and Miyao, Ichiro, 4,689,919, Cl. 51-206.00P.
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Adrian, Willy; and Wente, Gerald, 4,690,264, Cl. 198-335.000.
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Mendoza, Abel; and Otterbacher, Eric W., 4,691,042, Cl. 560-61.000.
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Seyerle, Carl E., 4,689,939, Cl. 56-11.100.
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Outlaw, William F. Electrically heated decal stripping tool. 4,690,724, Cl. 156-584.000.
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Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,691,050, Cl. 562-406.000.
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Owen, William E. Side-mounted monorail transportation system. 4,690,064, Cl. 104-119.000.
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Beard, Robert W., 4,690,492, Cl. 350-96.200.

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Valenyi, Louis J.; Pesa, Frederick A.; and Paparizos, Christos, 4,690,777, Cl. 252-373.000.
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Falcetta, Joseph J.; and Park, Joonsup, 4,690,993, Cl. 526-242.000.
Parker, Laurence: *See*—
Horne, David; and Parker, Laurence, 4,690,286, Cl. 211-41.000.
Pasch, Manfred: *See*—
Klose, Sigmar; Pasch, Manfred; Schlumberger, Helmut; Kleemann, Wolfgang; and Vieth, Friedhelm, 4,690,899, Cl. 436-45.000.
Paskus, Anthony: *See*—
Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., 4,690,552, Cl. 356-35.500.
Patel, Thakor R.: *See*—
Haard, Norman F.; and Patel, Thakor R., 4,690,826, Cl. 426-36.000.
Patel, Vithal K.: *See*—
Powell, David R.; and Patel, Vithal K., 4,690,824, Cl. 424-468.000.
Pau, Bernard: *See*—
Duheille, Jean; Pau, Bernard; and Gros, Pierre, 4,690,906, Cl. 436-512.000.
Paukovits, Edward J., Jr.: *See*—
Croman, Stanley W. T.; Jordan, Janet M.; and Paukovits, Edward J., Jr., 4,690,266, Cl. 198-388.000.
Paulik, Frank E.; Hershman, Arnold; Knox, Walter R.; and Roth, James F., to Monsanto Company. Rhodium-containing carbonylation catalysts with halogen-containing promoter. 4,690,912, Cl. 502-161.000.
Paulsen, Gustav. Means for compensating for variations in the matrix height and optionally the paper thickness on a rotary printing machine. 4,690,052, Cl. 101-216.000.
Paustian, John E.: *See*—
Suciu, George D.; and Paustian, John E., 4,691,031, Cl. 549-258.000.
Pavlin, Mark S.: *See*—
Veazey, Richard L.; and Pavlin, Mark S., 4,690,984, Cl. 525-332.300.
Pawloski, Chester E.: *See*—
Wampfler, David J.; Fielding, Donna J.; and Pawloski, Chester E., 4,690,954, Cl. 521-107.000.
Pearce, Phillip W.: *See*—
Calver, John G.; Pearce, Phillip W.; and Zielinski, Erich, 4,691,265, Cl. 361-386.000.
Pearce, Roscoe L.: *See*—
Cringle, David C.; Pearce, Roscoe L.; and DuPart, Michael S., 4,690,740, Cl. 204-147.000.
Peebles, Ann L.: *See*—
Wong, Mon N.; and Peebles, Ann L., 4,691,177, Cl. 333-113.000.
Peerless Machine & Tool Corporation: *See*—
Alexander, Garold W.; Hyder, Lonnie E.; and Wright, Robert V., 4,690,666, Cl. 493-152.000.
Pehker, Manfred: *See*—
Metz, Josef; Pehker, Manfred; and Zielinski, Erich, 4,690,031, Cl. 89-36.130.
Peletz, Lawrence J., Jr.; and Jukkola, Glen D., to Combustion Engineering, Inc. Method for drying coal with hot recycle material. 4,690,076, Cl. 110-347.000.
Pelley, Perry H., III; and Lewandowski, Alan, to Motorola, Inc. Redundant column substitution architecture with improved column access time. 4,691,300, Cl. 365-200.000.
Penhasi, Harry A.: *See*—
Leytes, Lev J.; and Penhasi, Harry A., 4,690,165, Cl. 137-112.000.
Penland, William Z.: *See*—
Lyddy, James E., Jr.; Penland, William Z.; and Sugarbaker, Paul H., 4,690,131, Cl. 128-4.000.
Penlon Limited: *See*—
Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., 4,690,562, Cl. 356-361.000.
Pennwalt Corporation: *See*—
Georgiev, Vassil S.; and Mullen, George B., 4,691,051, Cl. 562-443.000.
Pepe, Enrico J.: *See*—
Pohl, Eric R.; and Pepe, Enrico J., 4,691,038, Cl. 556-407.000.
Pereira, Jamie: *See*—
Fitzmorris, Tyce; Espenhahn, Eric; and Pereira, Jamie, 4,691,231, Cl. 358-106.000.
Pereira-Ramos, Jean-Pierre: *See*—
Gabano, Jean-Paul; Broussely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, 4,690,877, Cl. 429-194.000.
Perichon, Jacques: *See*—
Gabano, Jean-Paul; Broussely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, 4,690,877, Cl. 429-194.000.
Perini, Fabio. Sail rigging with fairing. 4,690,088, Cl. 114-102.000.
Perry, Mordechai: *See*—
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,765, Cl. 210-654.000.
Linder, Charles; Aviv, Gershon; Perry, Mordechai; and Kotraro, Reuven, 4,690,766, Cl. 210-654.000.
Persbeck, Sven-Erik, to Hermansson, Mats. Securing arrangement so executed as to be tripped on actuation. 4,690,091, Cl. 114-221.00A.
Pesa, Frederick A.: *See*—
Valenyi, Louis J.; Pesa, Frederick A.; and Paparizos, Christos, 4,690,777, Cl. 252-373.000.
Peter, Rudolf; Jahnel, Ernst; and Kunz, Hans-Peter, to Zahnraderfabrik Renk AG. Ship propulsion transmission with at least one engageable friction clutch. 4,690,261, Cl. 192-87.130.
Peter, Wolfgang: *See*—
Hoft, Peter; Peter, Wolfgang; Bergsteiner, Johann; Berschiek, Gunter; Drobe, Wolfgang; Engelke, Fritz; Hacke, Heinz; Hebbinghaus, Walter; and Kuhnert, Siegfried, 4,690,297, Cl. 220-273.000.
Peterson, Dennis P. Quick release retention of work pieces. 4,690,316, Cl. 224-253.000.
Peterson, G. L.: *See*—
Cantrell, C. D.; and Peterson, G. L., 4,690,742, Cl. 204-157.200.
Petery, James J.: *See*—
Miazga, Dennis E.; and Petery, James J., 4,691,317, Cl. 371-20.000.
Petter, Karl H.; and Robbins, Gregory K., to Texaco Inc. Corrosion detection for marine structure. 4,690,587, Cl. 405-211.000.
Pezewski, Paul: *See*—
Hornagold, John T.; and Pezewski, Paul, 4,690,246, Cl. 182-2.000.
Pfaff Industriemaschinen GmbH: *See*—
Dietrich, Herbert, 4,689,974, Cl. 69-27.000.
Pfeifle, Dieter: *See*—
Verburgh, Martin B.; and Pfeifle, Dieter, 4,691,092, Cl. 219-121.01.D.
Pfister, Rudolf: *See*—
Aschwanden, Werner; Branca, Quirico; Kyburz, Emilio; and Pfister, Rudolf, 4,691,040, Cl. 558-44.000.
Pfizer Inc.: *See*—
Kadin, Saul B., 4,690,943, Cl. 514-418.000.
Phalangas, Charalambos J.: *See*—
Davis, Ronald I.; Phalangas, Charalambos J.; and Titus, George R., 4,690,817, Cl. 424-70.000.
Philip Morris Incorporated: *See*—
Podraza, Kenneth F., 4,690,157, Cl. 131-276.000.
Philippe, Staron: *See*—
Arens, Georges; and Philippe, Staron, 4,691,306, Cl. 367-40.000.
Phillips, Charles R., to Support Technologies, Inc. ROM emulator for diagnostic tester. 4,691,316, Cl. 371-20.000.
Phillips Petroleum Company: *See*—
Burns, Lyle D.; and Stahl, G. Allan, 4,690,219, Cl. 166-307.000.
Carrow, Guy E., 4,690,632, Cl. 425-429.000.
Johnson, Timothy W.; Beever, William H.; O'Connor, James E.; and Blackwell, Jennings P., 4,690,972, Cl. 524-609.000.
McDaniel, Max P.; and Short, James N., 4,690,990, Cl. 526-138.000.
Rohlfing, Raymond G., 4,690,804, Cl. 422-219.000.
Phillips, Randall L. Take-up bracket for flooring adjustment. 4,690,359, Cl. 248-300.000.

Pickering, William: *See—*
Baumgartner, Kenneth A.; and Pickering, William, 4,691,149, Cl. 318-331.000.
Pierrel, Michel: *See—*
Gourmel, Yves; and Pierrel, Michel, 4,690,199, Cl. 164-421.000.
Pike, Harold W. E.: *See—*
Tuckley, Trevor R.; and Pike, Harold W. E., 4,690,412, Cl. 277-184.000.
Pimlott, John R.: *See—*
Beaver, Richard N.; Morris, Gregory J.; Pimlott, John R.; and Dang, Hiep D., 4,690,748, Cl. 204-279.000.
Pinschmidt, Robert K., Jr.; Dixon, Dale D.; and Burgoyne, William F., Jr., to Air Products and Chemicals, Inc. Self- and hydroxyl reactive formaldehyde-free cyclic hemiamidal and hemiamide ketal crosslinking monomers. 4,691,026, Cl. 548-531.000.
Pinto, Akiva, to John D. Hollingsworth On Wheels, Inc. WEB weight control system. 4,689,857, Cl. 19-105.000.
Pinto, Patrick A.: *See—*
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Pinto, Patrick A.; and Versace, Richard W., 4,690,922, Cl. 514-210.000.
Pinyan, James A.: *See—*
Buckley, B. Shawn; Reichwein, Roy H.; Buckley, Edward M.; and Pinyan, James A., 4,690,284, Cl. 209-590.000.
Pioneer Electronic Corporation: *See—*
Ichikawa, Toshihito, 4,691,356, Cl. 381-4.000.
Kanda, Nobuo, 4,691,357, Cl. 381-10.000.
Maeda, Takanori, 4,691,098, Cl. 250-201.000.
Pipon, Yves; and Droulon, Georges, to A. & M. Cousin & Cie. Rapid locking device for an articulated seat. 4,690,458, Cl. 297-379.000.
Pirmasafe, Inc.: *See—*
Wirstrom, Peter; and Cork, William H., 4,691,355, Cl. 380-23.000.
PKM Verpackungssysteme GmbH & Co.: *See—*
Zoppa, Dieter, 4,689,938, Cl. 53-582.000.
Planar Systems, Inc.: *See—*
King, Christopher N.; Dolinar, Brian J.; Barrow, William A.; Flegal, Robert T.; Gulick, Paul E.; and Blacken, Laurin G., 4,691,144, Cl. 315-169.300.
Plaot, Michael, to Allied Corporation. Flat bed optical scanning beam deflection system. 4,690,485, Cl. 350-6.500.
Plessey Overseas Limited: *See—*
Shapter, Hugh; and Wood, Colin, 4,691,206, Cl. 343-700.0MS.
Plett, Calvin: *See—*
Rosenbaum, Stanley D.; and Plett, Calvin, 4,691,271, Cl. 363-60.000.
Plueddemann, Edwin P., to Dow Corning Corporation. Polyethylene composite comprising a coupling agent composition comprising fumaric acid and an aminosilane. 4,690,959, Cl. 523-213.000.
Pneumatic Pipewipers, Inc.: *See—*
Stannard, James P.; and Shockley, Charles W., 4,690,213, Cl. 166-84.000.
Podolak, Peter L.: *See—*
Friedman, Alexander A.; and Podolak, Peter L., 4,690,755, Cl. 210-96.100.
Podraza, Kenneth F., to Philip Morris Incorporated. Smoking compositions containing a flavorant-release additive. 4,690,157, Cl. 131-276.000.
Pohl, Eric R.; and Pepe, Enrico J., to Union Carbide Corporation. Novel room temperature vulcanizable polydiorganosiloxane compositions. 4,691,038, Cl. 556-407.000.
Pol, Kenneth J.: *See—*
Draper, Reed T.; Pol, Kenneth J.; and Martin, Dennis R., 4,690,303, Cl. 221-131.000.
Polach, Wilhelm, to Robert Bosch GmbH. Device for removing solid particles, particularly soot, from exhaust gas of an internal combustion engine. 4,689,951, Cl. 60-275.000.
Polach, Wilhelm; and Rembold, Helmut, to Robert Bosch GmbH. Magnetic valve for fluid control. 4,690,374, Cl. 251-129.020.
Polaroid Corporation: *See—*
DeBruyn, Frank E., Jr.; and Weed, Lucretia J., 4,690,884, Cl. 430-206.000.
Forsyth, Robert P., 4,690,512, Cl. 350-417.000.
Silver, Bruce R., 4,691,253, Cl. 360-33.100.
Polatas, Stephen M.: *See—*
Abdenour, Stephen F.; and Polatas, Stephen M., 4,690,352, Cl. 249-49.000.
Poncy, Richard P.; and Chrzanowski, Mathew, to Steridyne Corporation. Chair with lift assistance mechanism. 4,690,457, Cl. 297-337.000.
Pont-a-Mousson S.A.: *See—*
Gourmel, Yves; and Pierrel, Michel, 4,690,199, Cl. 164-421.000.
Porter, Rick A.; and Hoernle, Hans R., to United Merchants & Manufacturers Inc. Fire barrier fabrics. 4,690,859, Cl. 428-251.000.
Posselt, Klaus: *See—*
Lohner, Manfred; and Posselt, Klaus, 4,690,823, Cl. 424-456.000.
Poutignat, Yves: *See—*
Gissinger, Patrick; and Poutignat, Yves, 4,690,630, Cl. 425-236.000.
Powell, David R.; and Patel, Vithal K., to Redi-Rowell, Inc. Solid pharmaceutical formulations for slow, zero order release via controlled surface erosion: expanded range. 4,690,824, Cl. 424-468.000.
PPG Industries, Inc.: *See—*
Singer, Debra L.; Birkmeyer, William J.; Dowbenko, Rostyslaw; and Kania, Charles M., 4,690,980, Cl. 525-286.000.
Smoot, Michael A.; Barch, Herbert W.; and Das, Balbhadra, 4,690,760, Cl. 210-321.500.
Prescher, Gunter: *See—*
Andrade, Juan; Prescher, Gunter; and Kohler, Klaus, 4,691,062, Cl. 568-495.000.
Priam Corporation: *See—*
Cloke, Robert L., 4,691,254, Cl. 360-45.000.
Priaroggia, Paolo G., to Societa Cavi Pirelli S.p.A. Pressure resistant submarine optical fiber cable. 4,690,498, Cl. 350-96.230.
Prince Corporation: *See—*
Boerema, Edward T.; Suman, Michael J.; and Fleming, Dennis J., 4,690,450, Cl. 296-97.00K.
Pritchard, John J., Jr., to Shell Offshore Inc. Formation fluid sampler. 4,690,216, Cl. 166-264.000.
Procter & Gamble Company, The: *See—*
Higgins, Maureen L., 4,690,680, Cl. 604-386.000.
Kupper, Philip L.; Moore, Katherine L.; and Swaine, Robert L., Jr., 4,690,827, Cl. 426-548.000.
Product Investment Incorporated: *See—*
Henning, John C., 4,690,292, Cl. 215-201.000.
Product Suppliers AG: *See—*
Aarts, Mathias L. C., 4,689,987, Cl. 73-49.300.
Productive Instrument & Machine Inc.: *See—*
Skipper, Claud, 4,690,167, Cl. 137-382.000.
Profera, Charles E., Jr., to RCA Corporation. Beam forming network for circularly polarized shaped beam antenna system. 4,691,205, Cl. 342-365.000.
Progressive Assembly Machine Co., Inc.: *See—*
Rasmussen, Robert, 4,690,310, Cl. 222-309.000.
Pruitt, Duard L., to RCA Corporation. Current fed inverter bridge with lossless snubbers. 4,691,270, Cl. 363-56.000.
Przybylinski, Phillip G.: *See—*
Wille, Herbert S.; Przybylinski, Phillip G.; and Raidt, Joe B., 4,690,072, Cl. 105-406.100.
Puchalski, Eugene, Jr.; Schneider, Emil F.; Cohee, Judith A.; and El-Menshawy, El-Sayed, to Charles of the Ritz Group Ltd. Shampoo and bath and shower gel. 4,690,818, Cl. 424-70.000.
Pullen, Francis J.: *See—*
Wakefield, Barry R.; and Pullen, Francis J., 4,689,854, Cl. 17-1.00R.
Pullman Rail Leasing Inc.: *See—*
Miller, Roy W., 4,690,070, Cl. 105-377.000.
Pullman Standard Inc.: *See—*
Wille, Herbert S.; Przybylinski, Phillip G.; and Raidt, Joe B., 4,690,072, Cl. 105-406.100.
Qualtronics Corporation: *See—*
Veitch, Randall C., 4,690,569, Cl. 374-11.000.
Quantime, Inc.: *See—*
Hines, Robin H.; Glasscock, Michael R.; and Johnson, D. Bruce, 4,690,025, Cl. 84-1.180.
Quick, Nathaniel R.: *See—*
Lyons, Alan M.; Mendenhall, Frederick T., Jr.; Robbins, Murray; Quick, Nathaniel R.; and Wilkins, Cletus W., Jr., 4,691,091, Cl. 219-121.0LM.
Quinlan, Leland F. Variable buoyancy fishing lure. 4,689,914, Cl. 43-42.220.
R.A.T.P. Regie Autonome des Transports Parisiens: *See—*
Delfourne, Paul, 4,690,068, Cl. 105-8.100.
R. Neumann & Co.: *See—*
Mulvaney, Lewis W., 4,689,832, Cl. 2-161.00A.
Rabuse, Milton. Aquatic scrubbing device. 4,690,092, Cl. 114-222.000.
Radscheit, Kurt: *See—*
Uhmann, Rainer; and Radscheit, Kurt, 4,691,008, Cl. 530-339.000.
Radulski, Charles A.; and Till, Henry R., to Xerox Corporation. Transfer apparatus. 4,690,539, Cl. 355-3.0TR.
Radvan, Bronislaw; and Till, Andrew, to Wiggins Teape Group Limited, The. Fibre reinforced composite plastics material. 4,690,860, Cl. 428-290.000.
Radyne Corporation: *See—*
Entenman, Alan W., 4,691,318, Cl. 371-43.000.
Raeuber, Armin: *See—*
Eyer, Achim; Raeuber, Armin; and Schillinger, Norbert, 4,690,797, Cl. 419-23.000.
Rahrig, Thomas F.; and Hall, Thomas E., to United Technologies Automotive, Inc. Sealed electrical connector assembly. 4,690,478, Cl. 439-271.000.
Raidel, John E., Sr. Fork mount mono-wheel suspension. 4,690,427, Cl. 280-694.000.
Raidt, Joe B.: *See—*
Wille, Herbert S.; Przybylinski, Phillip G.; and Raidt, Joe B., 4,690,072, Cl. 105-406.100.
Rakhit, Ajit K., to Reliance Electric Company. Method and apparatus for producing pseudo - herringbone-type gears and gear produced thereby. 4,690,009, Cl. 74-409.000.
Rambow, Frederick H. K., to Shell Oil Company. AGC circuit for televiewer. 4,691,307, Cl. 367-69.000.
Ramirez, Jose E.: *See—*
Vishnupad, Mohan; and Ramirez, Jose E., 4,690,774, Cl. 252-309.000.
Ramlow, Gerhard G.; Heyman, Duane A.; and Grace, Oscar M., to BASF Corporation. Process for the preparation of graft polymer dispersions and flame-retardant polyurethane foams. 4,690,956, Cl. 521-137.000.
Randolph, Walter J. Coaxial coupling. 4,690,481, Cl. 439-585.000.
Raney, Richard C. Radially stabilized drill bit. 4,690,229, Cl. 175-325.000.
Ranke, Gerhard; and Schrader, Ulrich, to Linde Aktiengesellschaft. Integrated production of ammonia and urea. 4,690,812, Cl. 423-359.000.

Rashkovich, Mikhail P.: *See*—
Vernikov, Arkady Y.; Gamarnik, Iosif I.; Rashkovich, Mikhail P.; Trostanovsky, Boris A.; and Khinkus, Alexandr S., 4,691,183, Cl. 335-289.000.

Rasmussen, Robert, to Progressive Assembly Machine Co., Inc. Sleeve pump. 4,690,310, Cl. 222-309.000.

Rasmussen, Robert, to Accurate Industries, Inc. Trailer for transporting large containers. 4,690,608, Cl. 414-529.000.

Ray-Chaudhuri, Dilip K.: *See*—
Shih, Yen-Jer; Tsai, John (Ji-Hsiung); Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., 4,690,996, Cl. 527-312.000.

Raychem Corp.: *See*—
Uken, William D.; Dubrow, Robert S.; Nelson, Carib; and Dittmer, Catherine A., 4,690,831, Cl. 427-44.000.

Raytheon Company: *See*—
Beckerleg, Richard A.; Fernald, Mark R.; LaTorre, Richard R.; and Grosso, Vincent A., 4,690,351, Cl. 244-3.160.
Grosso, Vincent A.; Estlick, Raymond J.; and Zarr, William A., 4,690,350, Cl. 244-3.100.
Kant, Rajni; and Chen, Kun-Nan, 4,691,161, Cl. 324-73.00R.

RCA Corporation: *See*—
Acampora, Alfonse A., 4,691,233, Cl. 358-136.000.
Albean, David L., 4,691,234, Cl. 358-144.000.
Carrell, Ross M., 4,690,283, Cl. 209-549.000.
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,691,189, Cl. 340-347.0AD.
Dinkel, Nancy A.; Goldstein, Bernard; and Ettenberg, Michael, 4,691,320, Cl. 372-45.000.
Kramer, William M., 4,689,873, Cl. 437-2.000.
Magee, Charles W.; and Hewitt, Lori R., 4,691,109, Cl. 250-426.000.
Masterton, Walter D., 4,691,138, Cl. 313-403.000.
Profera, Charles E., Jr., 4,691,205, Cl. 342-365.000.
Pruitt, Duard L., 4,691,270, Cl. 363-56.000.
Rothweiler, Joseph H., 4,691,292, Cl. 364-724.000.
Wine, Charles M., 4,691,310, Cl. 369-50.000.

Readman, John: *See*—
Hayden, Howard L.; Vaghani, Vallabh V.; and Readman, John, 4,690,470, Cl. 439-13.000.
Niggemann, Richard; and Readman, John, 4,690,210, Cl. 165-159.000.

Rebeaud, Jean-Philippe, to ETS SA Fabriques d'Ebauches. Electrical connection arrangement between the bracelet and the case of an electronic appliance to be worn on the wrist. 4,690,567, Cl. 368-203.000.

Rebmann, Manfred; and Weigold, Helmut, to Robert Bosch GmbH. Method and apparatus for making a butt seam having a cover strip on a tube of multi-layer packaging material. 4,690,668, Cl. 493-297.000.

Redden, Robert F.: *See*—
Bult, Roelof P.; Bollong, Alan B. I.; and Redden, Robert F., 4,690,725, Cl. 156-617.00R.

Redi-Rowell, Inc.: *See*—
Powell, David R.; and Patel, Vithal K., 4,690,824, Cl. 424-468.000.

Redman, Michael J.; Wong, Ming K.; and Sugden, Peter R., to STC plc. Address code arrangements. 4,691,339, Cl. 379-62.000.

Rees, Herbert: *See*—
Schad, Robert D.; Rees, Herbert; Hughes, Gary; and Murchie, John R., 4,690,633, Cl. 425-526.000.

Reeser, David M.: *See*—
Breneman, William C.; and Reeser, David M., 4,690,810, Cl. 423-335.000.

Reeves, Raymond A. Device for supporting a building line reference. 4,689,889, Cl. 33-408.000.

Reguigne, Gabriel: *See*—
Sauer, Claude; Burger, Raymond; Reguigne, Gabriel; and Kern, Mark, 4,690,874, Cl. 428-537.100.

Reichel, Anton; Lohmann, Bernard; Kolb, Eugen; Hochkonig, Manfred; Burst, Hermann; and Kretschmer, Helmut, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Air inlet channel for a charging air intercooler. 4,690,204, Cl. 165-44.000.

Reichel, Jutta: *See*—
Nebe, Wolfgang; Reichel, Jutta; Biehler, Klaus; Lucht, Hartmut; and Drommert, Heinz, 4,691,110, Cl. 250-458.100.

Reichel, Kenneth R.; and Hebrock, Steve, to Audio-Technica U.S., Inc. Duplex microphone communication system. 4,691,349, Cl. 379-391.000.

Reichwein, Roy H.: *See*—
Buckley, B. Shawn; Reichwein, Roy H.; Buckley, Edward M.; and Pinyan, James A., 4,690,284, Cl. 209-590.000.

Reid, Laurance S. Absolute separator. 4,690,698, Cl. 55-89.000.

Reinders, Edward D.: *See*—
Laugs, Johannis A. B.; Van Den Berg, Gerrit; Van Daalen, Peter A.; and Reinders, Edward D., 4,690,718, Cl. 156-48.000.

Reinhardt, Peter: *See*—
Morgenstern, Bernd; Weigend, Helmut; and Reinhardt, Peter, 4,690,564, Cl. 356-445.000.

Reinhart, Charles W.; and Mauldin, Robert H., to Whittaker Corporation. Hermetically sealed connector device. 4,691,080, Cl. 174-88.00R.

Reisner, Robert J., to Para-Tech Industries, Inc. Weighted golf grip. 4,690,407, Cl. 273-81.00A.

Reliance Comm/Tec Corporation: *See*—
Kuwata, Yutaka; and Nerone, Louis R., 4,691,273, Cl. 363-132.000.

Reliance Electric Company: *See*—
Griffen, Neil C., 4,691,290, Cl. 364-567.000.
Rakhit, Ajit K., 4,690,009, Cl. 74-409.000.

Rembold, Helmut: *See*—
Linder, Ernst; Rembold, Helmut; Straubel, Max; and Teegen, Walter, 4,690,373, Cl. 251-129.020.
Polach, Wilhelm; and Rembold, Helmut, 4,690,374, Cl. 251-129.020.

ReMine, Walter J.: *See*—
King-Smith, Eric A.; ReMine, Walter J.; and Dufresne, Joel R., 4,690,145, Cl. 128-421.000.

Renaud, Merle A.: *See*—
Han, Doyoung; and Renaud, Merle A., 4,689,967, Cl. 62-201.000.

Renbeck, Robert B.: *See*—
Jambotkar, Chakrapani G.; and Renbeck, Robert B., 4,689,869, Cl. 437-44.000.

Rende, Anthony V., Jr., to Lord Corporation. Heat activated silicon-based adhesive. 4,690,966, Cl. 524-264.000.

Renken, Wayne G.: *See*—
Bosley, Robert W.; Kirshman, Samson; LeMay, Dan B.; and Renken, Wayne G., 4,690,371, Cl. 251-65.000.

Repligen Corporation: *See*—
Farrell, Roberta L., 4,690,895, Cl. 435-278.000.
Palmer, John L.; and Anilionis, Algis, 4,691,009, Cl. 530-350.000.

Research Corporation: *See*—
Schott, Hans; and Royce, Alan E., 4,690,775, Cl. 252-312.000.

Resh, Kyle W., to Vista Chemical Company. Process for production of alkyl aromatics. 4,691,068, Cl. 585-323.000.

Resource Technology Associates: *See*—
Shaw, Douglas R., 4,690,752, Cl. 209-5.000.

Rex, Dietrich: *See*—
Hornung, Ernst; and Rex, Dietrich, 4,690,355, Cl. 244-173.000.

Rexnord Inc.: *See*—
Fredericks, Walter A.; and McCullough, Edward W., 4,690,661, Cl. 464-78.000.

Reynard, Kenneth, to George Blair Public Limited Company. Location means for freight container door locking assemblies. 4,690,442, Cl. 292-218.000.

Rheinmetall GmbH: *See*—
Metz, Josef; Pehker, Manfred; and Zielinski, Erich, 4,690,031, Cl. 89-36.130.

Rheon Automatic Machinery Co., Ltd.: *See*—
Takao, Kenji, 4,690,269, Cl. 198-460.000.

Rhone-Poulenc Agrochimie: *See*—
Chene, Alain; and Borrod, Guy, 4,690,708, Cl. 71-94.000.

Rhone-Poulenc Specialites Chimiques: *See*—
LaGarde, Robert; and Bouverot, Noel, 4,690,967, Cl. 524-266.000.

Ribbing, Wilfried: *See*—
Jadamus, Hans; Ribbing, Wilfried; and Feinauer, Roland, 4,690,978, Cl. 525-152.000.

Rice, Camilla A., to E.C.C. America Inc. Process for surface treating clay minerals and resultant products. 4,690,868, Cl. 428-409.000.

Rice Multiphones, Inc.: *See*—
McAlevey, Richard J.; Muir, Malcolm D.; and van der Laan, Johan S., 4,691,345, Cl. 379-158.000.

Richoux, Raymond. Flexible-tube device for transmitting longitudinal forces. 4,690,014, Cl. 74-501.00R.

Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

Ricoh Company, Ltd.: *See*—
Furuta, Hideya; Koizumi, Yutaka; Mamizuka, Mitsuru; and Sakai, Yoshihiro, 4,690,542, Cl. 355-4.000.
Kouchiwa, Taira; and Nishina, Kiichiro, 4,690,518, Cl. 350-464.000.
Nagai, Kayoko; and Tsubuko, Kazuo, 4,690,881, Cl. 430-114.000.
Nakamura, Hitoshi; Kaneko, Yujiro; Sawada, Yasuo; Machida, Hajime; Omi, Fumiya; and Watada, Atsuyuki, 4,690,861, Cl. 428-623.000.
Sakai, Yoshihiro; Ikeda, Itsuo; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, 4,690,541, Cl. 355-4.000.

Rieger, Wolfhart; Gauckler, Ludwig; Maurer, Albert; and Kampfer, Konrad, to Swiss Aluminium Ltd. Filter medium in the form of a stable porous body. 4,690,763, Cl. 210-496.000.

Rieter Machine Works, Ltd.: *See*—
Lattion, Andre; Bischofberger, Jurg; Salvik, Walter; Stapfer, Jakob; and Schreiber, Manfred, 4,689,945, Cl. 57-263.000.

Riker Laboratories, Inc.: *See*—
Stern, Richard M., 4,691,016, Cl. 546-95.000.

Riley, Mack W., to International Business Machines Corporation. Frequency multiplier circuit. 4,691,170, Cl. 328-20.000.

Riley, Ray J.: *See*—
Ethington, Don; Riley, Ray J.; and Tock, Richard W., 4,690,743, Cl. 204-168.000.

Riml, Peter, to Liebherr-Werk Telfs GES. m.b.H. Tracklaying undercarriage for bulldozer, crawler loaders or other tracklaying vehicles. 4,690,231, Cl. 180-6.480.

Rink, Richard H., to Huron Manufacturing Corporation. Cutting head for strip mining apparatus. 4,690,461, Cl. 299-39.000.

Risdon Corporation: *See*—
Idec, Eric J.; and Holloway, Thomas F., 4,690,578, Cl. 401-78.000.

Rise, Mark T.; and Stanton, David J., to Medtronic, Inc. Wireless transcutaneous electrical tissue stimulator. 4,690,144, Cl. 128-419.00R.

Ritchie, Robert C.; McKone, Henry J.; and Stamm, Richard H., to Dart Industries Inc.; and Energy Systems Industries, Inc. Refrigerant cooled plastic molding, method and apparatus. 4,690,789, Cl. 264-40.100.

Ritter, Paul B., Jr., to Shell California Production Inc. Well tubing hanger method and apparatus for use in well control. 4,690,221, Cl. 166-382.000.

Ritzert, Jack L.: *See*—
Manning, Thomas J.; Ritzert, Jack L.; Blouin, Joseph D.; and Mowinski, Josephine A., 4,690,435, Cl. 285-256.000.

Rivest, Ronald L.; and Shamir, Adi, to Massachusetts Institute of Technology. Method and apparatus for reusing non-erasable memory media. 4,691,299, Cl. 365-189.000.

Robbins, Gregory K.: *See*—
Petter, Karl H.; and Robbins, Gregory K., 4,690,587, Cl. 405-211.000.

Robbins, Murray: *See*—
Lyons, Alan M.; Mendenhall, Frederick T., Jr.; Robbins, Murray; Quick, Nathaniel R.; and Wilkins, Cletus W., Jr., 4,691,091, Cl. 219-121.0LM.

Robert Bosch GmbH: *See*—
Domke, Klaus, 4,690,667, Cl. 493-213.000.
Linder, Ernst; Rembold, Helmut; Straubel, Max; and Teegen, Walter, 4,690,373, Cl. 251-129.020.
Polach, Wilhelm, 4,689,951, Cl. 60-275.000.
Polach, Wilhelm; and Rembold, Helmut, 4,690,374, Cl. 251-129.020.
Rebmann, Manfred; and Weigold, Helmut, 4,690,668, Cl. 493-297.000.
Schwartz, Reinhard, 4,690,624, Cl. 417-499.000.
Weischedel, Guido, 4,690,114, Cl. 123-357.000.

Robert Krause GmbH & Co. KG: *See*—
Kissel, Karl-Heinz, 4,690,580, Cl. 402-39.000.

Roberts, George W.; Hansel, James G.; and Shahani, Goutam H., to Air Products and Chemicals, Inc. Enhanced crude oil recovery. 4,690,215, Cl. 166-261.000.

Robertsen, Anthony L., to Elite Concepts, Inc. Programmable timing device. 4,690,566, Cl. 368-108.000.

Robertshaw Controls Company: *See*—
Fowler, Daniel L., 4,689,879, Cl. 29-622.000.

Robinson, Jeffrey I., to General DataComm, Inc. Analog-digital converter. 4,691,190, Cl. 340-347.0AD.

Robinson, Jerry W. System for rotating a drive mechanism for power generation. 4,691,115, Cl. 290-1.00R.

Robinson, Nelson M.: *See*—
Fadner, Thomas A.; Harenza, Edward R.; Hycner, Stanley H.; and Robinson, Nelson M., 4,690,055, Cl. 101-451.000.

Robinson, Ronald L.; and Honeycutt, Fred L., Jr., to United Technologies Corporation. Louvered seal flap edge stiffener. 4,690,330, Cl. 239-265.390.

Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., to Karl Thomae GmbH. 2-(Perhydro-1,4-diazino)-pyrimido(5,4-D)-pyrimidines, pharmaceutical compositions and use. 4,690,923, Cl. 514-222.000.

Rockenschaub, Walter; and Kepplinger, Werner, to Voest-Alpine Aktiengesellschaft. Metallurgical plant for producing a mixed gas. 4,690,387, Cl. 266-144.000.

Rockwell International Corporation: *See*—
Fadner, Thomas A.; Harenza, Edward R.; Hycner, Stanley H.; and Robinson, Nelson M., 4,690,055, Cl. 101-451.000.
Weber, James L., 4,690,253, Cl. 188-72.700.

Rode, Konrad: *See*—
Hofler, Siegfried; Rode, Konrad; and Schmidt, Reinhard, 4,689,990, Cl. 73-118.100.

Roehl, Franz, to Bentonspritz Nascgubeb GmbH Co. Spraying machine. 4,690,328, Cl. 239-227.000.

Roessiger, Claude, to Ocor Products Corporation. Flexible block packaging. 4,691,368, Cl. 383-10.000.

Rogers, Gerald H. Strengthened latch and striker bar structure for fence gates. 4,690,440, Cl. 292-54.000.

Rohlfing, Raymond G., to Phillips Petroleum Company. Catalyst feed system. 4,690,804, Cl. 422-219.000.

Rohm, Gunter H. Power chuck. 4,690,416, Cl. 279-110.000.

Rohweder, David S.: *See*—
Jackson, Gerald W.; and Rohweder, David S., 4,689,998, Cl. 73-669.000.

Roll, Walter F.; and Campbell, Michael, to Texas Instruments Incorporated. Four position interlacing apparatus. 4,690,486, Cl. 350-6.600.

Roman, Christopher D.: *See*—
Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,690,780, Cl. 252-572.000.

Rosenbaum, Stanley D.; and Plett, Calvin, to Northern Telecom Limited. Voltage multiplier and voltage multipliers in an amplifier with double rail output. 4,691,271, Cl. 363-60.000.

Rosenberg, Lior. Dermatome particularly useful for skin-grafting purposes. 4,690,139, Cl. 128-305.500.

Rosenberg, Steven A., to United States of America, Health and Human Services. Adoptive immunotherapy as a treatment modality in humans. 4,690,915, Cl. 514-2.000.

Ross, Christopher P., to Ipeco Europe Limited. Mobile loaders. 4,690,606, Cl. 414-495.000.

Ross, Daniel P.: *See*—
Hsiung, Chia Y.; and Ross, Daniel P., 4,691,176, Cl. 331-2.000.

Ross, Sidney A.; and Taylor, Lyn P. Method and system for utilizing electro-neuro stimulation in a bio-feedback system. 4,690,142, Cl. 128-419.00R.

Rossow, Harold E.: *See*—
Lane, George A.; and Rossow, Harold E., 4,690,769, Cl. 252-70.000.

Roth, Craig A.: *See*—
Armer, Leon N., Jr.; Antonio, Joseph M.; Roth, Craig A.; and VerWeire, James R., 4,690,061, Cl. 102-401.000.

Roth, James F.: *See*—
Paulik, Frank E.; Hershman, Arnold; Knox, Walter R.; and Roth, James F., 4,690,912, Cl. 502-161.000.

Roth, Siegfried: *See*—
Gehring, Fritz; Roth, Siegfried; and Semrau, Hans-Juergen, 4,690,177, Cl. 139-449.000.

Rothweiler, Herbert: *See*—
Voss, Harald; and Rothweiler, Herbert, 4,690,927, Cl. 514-282.000.

Rothweiler, Joseph H., to RCA Corporation. System for digital multiband filtering. 4,691,292, Cl. 364-724.000.

Rough, J. Kirkwood H.: *See*—
Nelson, Martin N.; and Rough, J. Kirkwood H., 4,691,239, Cl. 358-282.000.

Rouly, Eric; Dubuit, Jean-Louis; and Marette, Gilles, to Societe d'Exploitation des Machines Dubuit. Transfer system for article printing machine. 4,690,050, Cl. 101-35.000.

Rousseau, Carl H. Dental fastening device and method of use. 4,690,643, Cl. 433-213.000.

Rousseau, Jean: *See*—
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, 4,690,931, Cl. 514-317.000.

Roux, Jacques. Method for forming special color effects from a fluorescent lamp which is supplied with electrical power and a device for carrying out the method. 4,691,146, Cl. 315-287.000.

Roxlo, Charles B.; and Deckman, Harry W., to Exxon Research and Engineering Company. Micro-porous superlattice separations. 4,690,750, Cl. 208-310.00Z.

Royce, Alan E.: *See*—
Schott, Hans; and Royce, Alan E., 4,690,775, Cl. 252-312.000.

Rubin, Llewellyn A.; and Harrison, William H. Downhole telemetry apparatus and method. 4,691,203, Cl. 340-856.000.

Ruechardt, Christoph; Jaehme, Joachim; and Salz, Ulrich, to BASF Aktiengesellschaft. Preparation of optically active carboxylic acids. 4,691,020, Cl. 546-341.000.

Ruggieri, Daniela: *See*—
Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; and Salvati, Patricia, 4,690,929, Cl. 514-288.000.

Russo, Rudolph P. Anti-theft exhaust system for vehicles. 4,690,240, Cl. 180-287.000.

Rusterholz, John T.: *See*—
Danilenko, Michael; Rusterholz, John T.; and Lahti, Archie E., 4,691,279, Cl. 364-200.000.

Rutgers, the State University of New Jersey: *See*—
Chien, Yie W.; and Tojo, Kakuji, 4,690,683, Cl. 604-896.000.

Ryan, James W., to University of Miami. Anti-hypertensive agents. 4,690,936, Cl. 514-362.000.

Ryan, James W.; and Chung, Alfred, to University of Miami. Anti-hypertensive agents. 4,690,937, Cl. 514-362.000.

Ryan, James W.; and Chung, Alfred, to University of Miami. Anti-hypertensive agents. 4,690,938, Cl. 514-362.000.

Ryan, James W.; and Chung, Alfred, to University of Miami. Anti-hypertensive agents. 4,690,939, Cl. 514-362.000.

Ryan, James W.; and Chung, Alfred, to University of Miami. Anti-hypertensive agents. 4,690,940, Cl. 514-362.000.

Rybicki, Mathew A., to Motorola, Inc. One hundred percent duty cycle sample-and-hold circuit. 4,691,125, Cl. 307-353.000.

Rydefalk, Staffan; and Einarsson, Jens, to Svenska Traforskningsinstitutet. Device for separately measuring particles in a suspension. 4,689,988, Cl. 73-61.00R.

S&C Electric Company: *See*—
Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,690,780, Cl. 252-572.000.
Swanson, Roy T., 4,691,085, Cl. 200-151.000.

S.C. Johnson & Son, Inc.: *See*—
Brady, William T.; Norton, Scott J.; and Ko, Jinrea, 4,691,052, Cl. 562-506.000.
Crapser, James R.; and Demarest, Scott W., 4,690,312, Cl. 222-402.170.
Grothaus, Roger H.; and Hildebrandt, Donald W., 4,689,915, Cl. 43-112.000.

Sabol, George P.; and Barry, Robert F., to Westinghouse Electric Corp. Process for forming seamless tubing of zirconium or titanium alloys from welded precursors. 4,690,716, Cl. 148-11.50F.

Saburi, Masahiko: *See*—
Yoshikawa, Sadao; Saburi, Masahiko; Ikariya, Takao; Ishii, Youichi; and Akutagawa, Susumu, 4,691,037, Cl. 556-18.000.

Saccomanno, Geno. Microscope slide marking device and method. 4,690,521, Cl. 350-520.000.

Saft, S.A.: *See*—
Brezillon, Jean-Loup; and Dauchier, Jean-Michel, 4,689,880, Cl. 29-623.500.
Gabano, Jean-Paul; Broussely, Michel; Pereira-Ramos, Jean-Pierre; Messina, Richard; and Perichon, Jacques, 4,690,877, Cl. 429-194.000.

St. Pierre, Michael, to Marin-Tek, Inc. Zero gravity (position-insensitive) low-temperature multi-component refrigerator. 4,689,964, Cl. 62-114.000.

Saito, Gunji: *See*—
Inokuchi, Hiroo; Saito, Gunji; Seki, Kazuhiko; and Mori, Takehiko, 4,691,028, Cl. 549-36.000.

Saito, Hiroshi: *See*—
Masuda, Yoshinori; Saito, Hiroshi; and Kobayashi, Hiroshi, 4,690,994, Cl. 526-254.000.
Saito, Kazuo: *See*—
Kubo, Kanji; Asanuma, Nobuyoshi; Saito, Kazuo; and Yamamoto, Yasuhiko, 4,690,426, Cl. 280-690.000.
Saito, Naoki; Aoki, Kozo; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material containing novel cyan dye forming coupler. 4,690,889, Cl. 430-552.000.
Saito, Ryozo: *See*—
Izumi, Toshio; Saito, Ryozo; Kato, Yoichi; and Miyata, Hiroshi, 4,691,284, Cl. 364-424.000.
Saito, Susumu: *See*—
Iijima, Takeo; Nomura, Hiroshi; Saito, Susumu; and Echizen, Susumu, 4,690,619, Cl. 417-269.000.
Saito, Takao: *See*—
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, 4,690,788, Cl. 264-22.000.
Saito, Yutaka: *See*—
Shirahata, Kunikatsu; Kono, Motomichi; Saito, Yutaka; Kasai, Masaji; Morimoto, Makoto; and Ashizawa, Tadashi, 4,691,024, Cl. 548-422.000.
Saitoh, Kyoichiro; Konishi, Masataka; and Tomita, Koji, to Bristol-Myers Company. Boxazomycin A and B, new antibiotics containing benzoxazole nucleus. 4,690,926, Cl. 514-269.000.
Sajdak, Robert L.: *See*—
Wehr, Michael A.; and Sajdak, Robert L., 4,690,309, Cl. 222-249.000.
Sajiki, Kazuaki: *See*—
Nozue, Yasuhiro; Kajiyama, Koichi; and Sajiki, Kazuaki, 4,691,322, Cl. 372-82.000.
Sakai & Co., Ltd.: *See*—
Uchiyama, Yuki, 4,690,278, Cl. 206-387.000.
Sakai, Katsuo: *See*—
Sakai, Yoshihiro; Ikeda, Itsuo; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, 4,690,541, Cl. 355-4.000.
Sakai, Noriyuki: *See*—
Morishita, Tsuyoshi; Osaki, Sigemi; and Sakai, Noriyuki, 4,690,320, Cl. 228-194.000.
Sakai, Tadaaki. Method of freezing foods. 4,689,963, Cl. 62-64.000.
Sakai, Yasuhito; and Yamada, Kenichi, to Fuji Jukogyo Kabushiki Kaisha. Selector mechanism for an infinitely variable transmission. 4,690,011, Cl. 74-475.000.
Sakai, Yoshiaki; and Tsuyuguchi, Hiroshi, to Teac Corporation. Power saving circuit arrangement for data transfer apparatus with a diskette record medium. 4,691,255, Cl. 360-69.000.
Sakai, Yoshihiro; Ikeda, Itsuo; Sakai, Katsuo; Adachi, Tsukasa; Shinguryo, Satoshi; and Furuta, Hideya, to Ricoh Company, Ltd. Color electrophotographic copying process. 4,690,541, Cl. 355-4.000.
Sakai, Yoshihiro: *See*—
Furuta, Hideya; Koizumi, Yutaka; Mamizuka, Mitsuru; and Sakai, Yoshihiro, 4,690,542, Cl. 355-4.000.
Sakai, Yukio: *See*—
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Sakakibara, Shigeru; Arimoto, Shunji; Ishikawa, Hidenobu; and Maruyama, Osamu, to Dainippon Ink and Chemicals, Inc. Activation energy-curable resin composition. 4,690,987, Cl. 525-502.000.
Sakakibara, Toshiyuki: *See*—
Nanba, Yukihiro; and Sakakibara, Toshiyuki, 4,690,784, Cl. 260-403.000.
Sakakibara, Yuichi; Takahashi, Yukio; and Shima, Hideharu, to Kabushiki Kaisha Toshiba. Fluorescent lamp. 4,691,140, Cl. 313-486.000.
Sakamoto, Kyooya: *See*—
Yamane, Shigeki; Mori, Keijiro; and Sakamoto, Kyooya, 4,691,269, Cl. 363-41.000.
Sakamoto, Toshinori; Hirashima, Isao; and Tsuji, Seiichi, to Mazda Motor Corporation. Automobile instrument cluster tiltable with a steering column. 4,690,432, Cl. 280-775.000.
Saleem, Abdus, to General Electric Environmental Services, Inc. Process for the simultaneous absorption of sulfur oxides and production of ammonium sulfate. 4,690,807, Cl. 423-242.000.
Salvati, Patricia: *See*—
Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; and Salvati, Patricia, 4,690,929, Cl. 514-288.000.
Salvik, Walter: *See*—
Lattion, Andre; Bischofberger, Jurg; Salvik, Walter; Stapfer, Jakob; and Schreiber, Manfred, 4,689,945, Cl. 57-263.000.
Salz, Ulrich: *See*—
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Sam, George J., Sr.: *See*—
Gabriele, Joseph M.; Sam, George J., Sr.; Wolfe, John N.; and Parekh, Navinchandra J., 4,691,333, Cl. 378-37.000.
Sam Sung Electronics Co., Ltd.: *See*—
Chung, Bong-Kwan, 4,690,473, Cl. 439-1.000.
Sampson, Arthur J., Jr.: *See*—
Mattingly, William B., III; Cabe, Alex W., Jr.; Chapas, Richard B.; and Sampson, Arthur J., Jr., 4,690,679, Cl. 604-383.000.
Samson, Sam; and Gruenspecht, Mark J. Inflatable aquatic device. 4,690,651, Cl. 441-56.000.
Sanchez, Manuel: *See*—
Desarmot, Georges; and Sanchez, Manuel, 4,690,738, Cl. 204-130.000.
Sanchez, Terry: *See*—
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Sanders, Joseph W.: *See*—
Knoble, David W.; and Sanders, Joseph W., 4,691,341, Cl. 379-97.000.
Sanderson, John R.; Smith, William A.; Marquis, Edward T.; and Keating, Kenneth P., to Texaco, Inc. Purification of propylene oxide by treatment with calcium hydroxide in glycerol or sugar water. 4,691,034, Cl. 549-542.000.
Sanderson, John R.; Marquis, Edward T.; Smith, William A.; and Keating, Kenneth P., to Texaco Inc. Purification of propylene oxide by treatment with a selected base and inert salt. 4,691,035, Cl. 549-542.000.
Sandhagen, Jurgen: *See*—
Hofbauer, Peter; and Sandhagen, Jurgen, 4,690,118, Cl. 123-533.000.
Sando Iron Works Co., Ltd.: *See*—
Goto, Tokuju; Tanaka, Itsuo; Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,691,137, Cl. 313-30.000.
Sando, Yoshikazu: *See*—
Goto, Tokuju; Tanaka, Itsuo; Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,691,137, Cl. 313-30.000.
Sank, Gerald W., to Vulcan-Hart Corporation. Catalytic combustion deep fat fryer. 4,690,127, Cl. 126-391.000.
Sankyo Company, Limited: *See*—
Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, 4,691,027, Cl. 549-32.000.
Sano, Kenji: *See*—
Fukamizu, Hiroshi; Nakano, Masaji; Iba, Kunio; Yamasaki, Taro; and Sano, Kenji, 4,690,553, Cl. 356-51.000.
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Demarne, Henri; Filhol, Robert; and Mosse, Madeleine, 4,691,043, Cl. 560-064.000.
Duheille, Jean; Pau, Bernard; and Gros, Pierre, 4,690,906, Cl. 436-512.000.
Nisato, Dino; Crisafulli, Emilio; Bianchetti, Alberto; and Carminati, Paolo, 4,691,019, Cl. 546-330.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Ogasahara, Takio; and Fujimoto, Hiroaki, 4,690,109, Cl. 123-73.00A.
Sansome, Dennis H.: *See*—
Ibrahim, Ibrahim N.; and Sansome, Dennis H., 4,689,981, Cl. 72-150.000.
Santa Barbara Research Center: *See*—
Kern, Mark T.; and Shamordola, Kenneth A., 4,691,196, Cl. 340-578.000.
Santo, Philip J. Decorative cover for a floatation sleep system. 4,689,843, Cl. 5-452.000.
Santrade Ltd.: *See*—
Schermutzki, Konrad, 4,690,721, Cl. 156-307.500.
Sasaki, Akio: *See*—
Makino, Hiroshi; and Sasaki, Akio, 4,690,119, Cl. 123-571.000.
Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, to Mitsubishi Rayon Co., Ltd.; and Shin-Etsu, Chemical Co., Ltd. Impact-resistant thermoplastic polyorganosiloxane-based graft copolymer and process for producing same. 4,690,986, Cl. 525-479.000.
Sasaki, Kazuya: *See*—
Naito, Takanobu; Yokoyama, Masaaki; Sasaki, Kazuya; Yamamoto, Makoto; and Amemiya, Kouji, 4,691,014, Cl. 540-227.000.
Sasaki, Masafumi, to Nissan Motor Co., Ltd. Static pressure gas bearing apparatus for turbocharger. 4,690,572, Cl. 384-120.000.
Sasakura, Hachirou; and Tsujimura, Masakuni, to Nippondenso Co., Ltd. Ignition control system for internal combustion engines. 4,690,122, Cl. 123-609.000.
Sasano, Akiyoshi: *See*—
Hara, Kazumasa; Koike, Mikio; and Sasano, Akiyoshi, 4,690,083, Cl. 112-254.000.
Sasano, Ryoichiro; Toyohara, Tsutomu; and Takigawa, Toshimichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Apparatus for working peripheral wall of hemispherical shell. 4,690,020, Cl. 82-2.00D.
Sasatani, Takashi: *See*—
Takada, Susumu; Sasatani, Takashi; Shindo, Hirohisa; Matsushita, Akira; and Eigyo, Masami, 4,690,930, Cl. 514-293.000.
Sasaya, Hideaki: *See*—
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Satake, Keigo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.
Satco, Inc.: *See*—
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Satellite Industries, Inc.: *See*—
Juaire, Phillip R.; Wagner, Frederic M.; and Wildgen, Leo F., 4,689,917, Cl. 49-380.000.
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Oba, Hiroki; Aoki, Seiichi; Niinuma, Akira; and Sato, Seiichiro, 4,690,484, Cl. 439-736.000.

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Satoh, Taizo, to Fujitsu Limited. Drive circuit for fluorescent display tube. 4,691,145, Cl. 315-169.300.

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Savineil, Alan; and Hydeman, Jeffrey E., to Westinghouse Electric Corp. Delivery system for a remote sensor. 4,689,994, Cl. 73-634.000.

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Savov, Ivan S.: *See*—
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Sawada, Yasuo: *See*—
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Sayers, George M., Jr.: *See*—
Walls, Henry M.; and Sayers, George M., Jr., 4,690,095, Cl. 116-67.00R.

Sayler, William H.; and White, Justin C., to T.A.S., Inc. Solid fuel pulverizer for pulverized fuel burning system. 4,690,338, Cl. 241-56.000.

Sayou, Syoichi: *See*—
Takahashi, Tokuyuki; Kuramochi, Koujiro; and Sayou, Syoichi, 4,690,239, Cl. 180-249.000.

Scalia, Antonino. Method of playing a letter selecting and arranging game. 4,690,409, Cl. 273-299.000.

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Maier, Helmut; Neumann, Bruno; and Schaafhausen, Ludwig R., 4,690,582, Cl. 403-252.000.

Schad, Robert D.; Rees, Herbert; Hughes, Gary; and Murchie, John R., to Husky Injection Molding Systems Ltd. Apparatus for preparing hollow plastic articles. 4,690,633, Cl. 425-526.000.

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Miller, John; Barton, Richard O.; and Schaefer, Oscar H., 4,690,365, Cl. 248-650.000.

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Schemmann, Hugo: *See*—
Bertram, Leo; and Schemmann, Hugo, 4,691,132, Cl. 310-156.000.

Schepers, Erwin, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Remotely-handled replaceable component. 4,690,298, Cl. 220-325.000.

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Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,691,049, Cl. 562-553.000.
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Pinto, Patrick A.; and Versace, Richard W., 4,690,922, Cl. 514-210.000.

Schermutzki, Konrad, to Santrade Ltd. Apparatus and process for the production of multilayer laminated plates. 4,690,721, Cl. 156-307.500.

Schick, Hans; Kolk, Erich; Fauth, Karl-Heinz; and Mohr, Heinrich, to BASF Aktiengesellschaft. Polymerization of isobutylene. 4,691,072, Cl. 585-525.000.

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Eyer, Achim; Raeuber, Armin; and Schillinger, Norbert, 4,690,797, Cl. 419-23.000.

Schlumberger, Helmut: *See*—
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Schmalbach-Lubeca AG: *See*—
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Schmaus, Siegfried H. A. Direct-acting pressure sensor. 4,690,000, Cl. 73-741.000.

Schmerda, Richard F.: *See*—
Damiano, Michael A.; and Schmerda, Richard F., 4,691,197, Cl. 340-638.000.

Schmidt, Frank T., to Coleman Company, Inc., The. Insulator assembly for electrode of piezoelectric ignition device. 4,691,136, Cl. 310-339.000.

Schmidt, Helmbrecht; Koch, Robert; and Seyer, Richard, to Hubner Gummi-und Kunststoff GmbH. Crossover shelter between sections of articulated road and rail vehicles. 4,690,421, Cl. 280-403.000.

Schmidt, Manfred; and Yeater, Robert P., to Mobay Corporation. Thermoplastic polyurethane compositions having improved flame resistance. 4,690,964, Cl. 524-125.000.

Schmidt, Phillip A., to Weyerhaeuser Company. Method and apparatus for flail debarking. 4,690,187, Cl. 144-340.000.

Schmidt, Reinhard: *See*—
Hofler, Siegfried; Rode, Konrad; and Schmidt, Reinhard, 4,689,990, Cl. 73-118.100.

Schmidt, Victor P. Pipe coupling. 4,690,434, Cl. 285-31.000.

Schmiegel, Klaus K.: *See*—
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Schneider, Emil F.: *See*—
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Schnizlein, Paul G.; and Tang, Wen-Tsung F., to Advanced Micro Devices, Inc. CMOS D-type flip-flop circuits. 4,691,122, Cl. 307-279.000.

Schnizler, Albrecht; Schulz, Manfred; and Bartmann, Klaus, to Metabowerke GmbH & Co. Hammer drill. 4,690,226, Cl. 173-128.000.

Schoeber, Gernot: *See*—
Einsle, Guenter; Mayr, Ernst; Oestreich, Ulrich; Schoeber, Gernot; and Schrey, Wolfgang, 4,689,943, Cl. 57-90.000.

Schorfheide, James J., to Exxon Research and Engineering Company. Removal of sulfur from process streams. 4,690,806, Cl. 423-230.000.

Schott, Hans; and Royce, Alan E., to Research Corporation. Emulsion-based gel and process for preparing same. 4,690,775, Cl. 252-312.000.

Schrader, Ulrich: *See*—
Ranke, Gerhard; and Schrader, Ulrich, 4,690,812, Cl. 423-359.000.

Schreiber, Manfred: *See*—
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Schrey, Wolfgang: *See*—
Einsle, Guenter; Mayr, Ernst; Oestreich, Ulrich; Schoeber, Gernot; and Schrey, Wolfgang, 4,689,943, Cl. 57-90.000.

Schroder, Joachim; Bozung, Hanns-Gunter; Bandel, Rudolf; and Mendle, Hans, to M.A.N. - B&W Diesel GmbH. Turbo supercharger for an internal combustion engine. 4,689,960, Cl. 60-607.000.

Schroeppel, Edward A., to Cordis Corporation. Pacing lead with piezoelectric power generating means. 4,690,143, Cl. 128-419.00P.

Schuitmaker, Pieter D.: *See*—
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Schultz, Abraham Y. Bottle with finger pieces. 4,690,311, Cl. 222-324.000.

Schultz, Richard. Hammer mill. 4,690,339, Cl. 241-73.000.

Schultz, Ward E.; and Smith, Harry D., Jr., to Halliburton Company. Borehole compensation method and apparatus using variations in relative borehole components. 4,691,102, Cl. 250-256.000.

Schulz, Gerd, to Gerd Schulz Fahrzeug- und Container-Technik. Hold down apparatus for the tippable structure of a vehicle. 4,690,232, Cl. 180-89.140.

Schulz, Manfred: *See*—
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Schumann, Klaus: *See*—
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Schummer, Helmut: *See*—
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Schwartz, Arthur G.; Gurries, Richard M.; and Johnson, Jay K. Long residence pollution control system. 4,690,697, Cl. 55-84.000.

Schwartz, Reinhard, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,690,624, Cl. 417-499.000.

Scientific Atlanta, Inc.: *See*—
Farmer, James O., 4,691,353, Cl. 380-15.000.

Scopes, David I. C.: *See*—
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Scott, Curtis E.; and McVey, Charles I., to General Electric Company. Glaze polishing polycrystalline alumina material. 4,690,727, Cl. 156-635.000.

Sebille, Michel, to Treficable Pirelli. Rotary extrusion head more especially for manufacturing cables with helical grooves for optical fibers. 4,690,627, Cl. 425-113.000.

Secretary of State for Defence, The: *See*—
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Securistyle Limited: *See*—
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Seiko Instruments & Electronics Ltd.: *See*—
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Seki, Kazuhiko: *See*—
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Sekiguchi, Kazuya: *See*—
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Sekimoto, Yukihiko; Yanagita, Makoto; and Kanda, Shoichi, to Lion Corporation; and Nitto Chemical Industry Co., Ltd. Process for production of modified hydroxyethyl cellulose. 4,691,013, Cl. 536-96.000.
Seltzer, Raymond: *See*—
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Seuster, Kurt. Door which can be rolled up. 4,690,194, Cl. 160-265.000.
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Seyerle, Carl E., to Outboard Marine Corporation. Operator presence control for self-propelled implements. 4,689,939, Cl. 56-11.100.
Seymour-Sheridan, Inc.: *See*—
Morgan, David L., 4,690,323, Cl. 236-99.00F.
Shafer, Steve: *See*—
Van Alstine, James M.; Harris, J. Milton; Shafer, Steve; Snyder, Robert S.; and Herren, Blair, 4,690,749, Cl. 204-299.00R.
Shahani, Goutam H.: *See*—
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Shamordola, Kenneth A.: *See*—
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Shapter, Hugh; and Wood, Colin, to Plessey Overseas Limited. Microstrip and cavity-backed aperture antenna. 4,691,206, Cl. 343-700.0MS.
Sharp Kabushiki Kaisha: *See*—
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Shaw, Douglas R., to Resource Technology Associates. Selective flocculation process for the recovery of phosphate. 4,690,752, Cl. 209-5.000.
Shawcross, Alfred L.; Stevens, Donn E.; and Jones, Robert E., to Bausch & Lomb Incorporated. Apparatus for use in transporting a photogrammetric microscope from a first position to a second position. 4,690,520, Cl. 350-517.000.
Shawcross, Brian E., to CIBA-GEIGY AG. Exposing frame. 4,690,547, Cl. 355-72.000.
Shell California Production Inc.: *See*—
Ritter, Paul B., Jr., 4,690,221, Cl. 166-382.000.
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Pritchard, John J., Jr., 4,690,216, Cl. 166-264.000.
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Rambow, Frederick H. K., 4,691,307, Cl. 367-69.000.
Shell, Stanley, to Digital Equipment Corporation. Cursor position controller. 4,691,199, Cl. 340-710.000.
Shephard, Margaret C.: *See*—
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Sherman, Charles F., to Esselte Pendaflex Corp. Display frame for mounting vertical surface. 4,689,906, Cl. 40-152.100.
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Shih, Yen-Jer; Tsai, John (Ji-Hsiung); Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Inverse emulsions. 4,690,996, Cl. 527-312.000.
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Shimizu, Haruo, to Canon Kabushiki Kaisha. Image data processing apparatus adaptable to output devices of different types. 4,691,237, Cl. 358-256.000.
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Shimizu, Yoshiro, to Isuzu Motors Ltd. Door glass assembly for automotive vehicles. 4,689,916, Cl. 49-374.000.
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Shinjo, Katsumi, to Yugen Kaisha Shinjoseisakusho. Self-piercing nut. 4,690,599, Cl. 411-180.000.

Shinkai, Hiroyuki: *See—*
Mochida, Ei; Shinkai, Hiroyuki; Kudo, Takashi; and Sugawara, Toshiyuki, 4,690,908, Cl. 436-518.000.

Shinkawa, Hiroyasu: *See—*
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Sato, Akihiko; Noto, Akira; Morita, Fumiaki; and Nakajima, Kunihiro, 4,690,819, Cl. 424-88.000.

Shionogi & Co., Ltd: *See—*
Takada, Susumu; Sasatani, Takashi; Shindo, Hirohisa; Matsushita, Akira; and Eigyo, Masami, 4,690,930, Cl. 514-293.000.

Shirafuji, Tamio; and Kawata, Itaru, to Sumitomo Chemical Company, Limited. Method for producing cycloalkanols. 4,691,064, Cl. 568-835.000.

Shirahata, Kunikatsu; Kono, Motomichi; Saito, Yutaka; Kasai, Masaji; Morimoto, Makoto; and Ashizawa, Tadashi, to Kyowa Hakko Kogyo Kabushiki Kaisha. New mitomycin derivatives, preparation thereof and pharmaceutical compositions containing them. 4,691,024, Cl. 548-422.000.

Shirahata, Ryuji; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,690,857, Cl. 428-216.000.

Shiraishi, Ryoichi: *See—*
Nishiguchi, Yasuo; Yasutomi, Tsuyoshi; and Shiraishi, Ryoichi, 4,691,210, Cl. 346-76.0PH.

Shirasawa, Hiroshi: *See—*
Umemoto, Yonetsugu; Shirasawa, Hiroshi; Ogo, Muneya; Kinoshita, Kazumasa; and Kondo, Tetsuo, 4,690,581, Cl. 403-133.000.

Shiroza, Teruaki: *See—*
Yamane, Kunio; Ohmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, 4,690,898, Cl. 435-320.000.

Shitori, Yoshiyasu: *See—*
Ogura, Haruo; Furuhata, Kimio; Onawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.

Shizume, Yasumichi, to NEC Corporation. Mixer circuit. 4,691,379, Cl. 455-319.000.

Shkedi, Zvi, to Garrett Corporation, The. Temperature compensated pressure transducer. 4,689,999, Cl. 73-708.000.

Shockley, Charles W.: *See—*
Stannard, James P.; and Shockley, Charles W., 4,690,213, Cl. 166-84.000.

Shoop, James D., to Diebold, Incorporated. Locking mechanism. 4,690,073, Cl. 109-59.00T.

Short Brothers PLC: *See—*
Moles, John A. G.; and McMahon, Colbert M., 4,690,007, Cl. 74-5.120.

Short, James N.: *See—*
McDaniel, Max P.; and Short, James N., 4,690,990, Cl. 526-138.000.

Showers, David F., to Glenwood Systems U.S.A., Ltd. Stationery set. 4,690,433, Cl. 283-1.00B.

Shwez, Mark. Agricultural implement for disposal of crop residue. 4,690,224, Cl. 172-45.000.

Sibata, Suegi, to Yamaichi Electric Mfg. Co., Ltd. IC package connector with contacts of high density. 4,690,646, Cl. 439-71.000.

Sieck, Reinhard: *See—*
Brusewitz, Gerhard; and Sieck, Reinhard, 4,690,896, Cl. 435-296.000.

Siegel, Myron: *See—*
Fazzolari, Anthony; and Fazzolari, Nicholas, 4,690,441, Cl. 292-57.000.

Siemens Aktiengesellschaft: *See—*
Einsle, Guenter; Mayr, Ernst; Oestreich, Ulrich; Schoeber, Gernot; and Schrey, Wolfgang, 4,689,943, Cl. 57-90.000.
Einzinger, Josef; Fellinger, Christine; Leipold, Ludwig; Tihanyi, Jenoe; and Weber, Roland, 4,691,129, Cl. 307-581.000.
Eyer, Achim; Raeuber, Armin; and Schillinger, Norbert, 4,690,797, Cl. 419-23.000.
Fritz, Otmar, 4,690,275, Cl. 206-331.000.
Fruhauf, Waldemar, 4,691,128, Cl. 307-557.000.
Held-Elbert, Gabriele; Kaiser, Wolfgang; and Schmutzler, Werner, 4,691,337, Cl. 379-24.000.
Herberg, Helmut, 4,691,221, Cl. 357-46.000.
Lange, Gottfried, 4,691,232, Cl. 358-111.000.
Mattausch, Hans J., 4,691,302, Cl. 365-240.000.
Telorack, Gerhard, 4,691,335, Cl. 378-152.000.
Wenger, Bruno, 4,691,327, Cl. 375-4.000.
Wolff, Pieter, 4,691,297, Cl. 364-900.000.

Sigelman, Jesse L.; and Miodownik, Saul, to Sigelman, Jesse L. Self-contained refrigerator open door indicator. 4,691,195, Cl. 340-545.000.

Sigri GmbH: *See—*
Kraus, Gunter, 4,691,324, Cl. 373-91.000.

Silicon Systems, Inc.: *See—*
Fukahori, Kiyoshi; and Glad, Thomas, 4,691,172, Cl. 330-129.000.

Silver, Bruce R., to Polaroid Corporation. Electronic imaging camera for recording either moving or still images. 4,691,253, Cl. 360-33.100.

Simen Aerials, Inc.: *See—*
Hornagold, John T.; and Pezewski, Paul, 4,690,246, Cl. 182-2.000.

Simier, Jean-Noel: *See—*
Nardi, Alain; and Simier, Jean-Noel, 4,690,800, Cl. 422-40.000.

Simko, Vlado, to State University of New York, The. High-caloric, high-fat dietary formula. 4,690,820, Cl. 424-128.000.

Simonet, Donald E.: *See—*
Zeck, Walter M.; and Simonet, Donald E., 4,690,947, Cl. 514-521.000.

Simpson, David C.: *See—*
Baker, Harold R.; Thrower, Eugene S.; and Simpson, David C., 4,690,779, Cl. 252-546.000.

Singer Company, The: *See—*
Bennett, William S., 4,691,280, Cl. 364-200.000.
Ljung, Bo H. G.; and Krupick, Walter J., 4,691,323, Cl. 372-107.000.

Singer, Debra L.; Birkmeyer, William J.; Dowbenko, Rostyslaw; and Kania, Charles M., to PPG Industries, Inc. Acrylic modified polymers. 4,690,980, Cl. 525-286.000.

Singh Rana, Virendra V.: *See—*
Luther, Lars C.; and Singh Rana, Virendra V., 4,690,726, Cl. 156-624.000.

Singleton, Eric: *See—*
Albers, Michel O.; and Singleton, Eric, 4,691,069, Cl. 585-259.000.

Siove, Alain: *See—*
Grubbs, Robert H.; Gilliom, Laura R.; and Siove, Alain, 4,690,992, Cl. 526-160.000.

Sircar, Shivaji; and Koch, William R., to Air Products and Chemicals, Inc. Oxidation of carbonaceous material. 4,690,696, Cl. 55-26.000.

Sitnikov, Alexandr E.: *See—*
Gradoboev, Vladimir T.; Sitnikov, Alexandr E.; Klimenov, Alexandr M.; and Melnikov, Leonid I., 4,690,267, Cl. 198-396.000.

Sjodin, Lars T.: *See—*
Hartler, Nils J. C.; Lekander, Karl-Erik; Sjodin, Lars T.; and Mjoberg, Per J., 4,690,731, Cl. 162-45.000.

SKF GmbH: *See—*
Olschewski, Armin; Hetterich, Hermann; Horling, Peter; and Stolz, Robert, 4,689,982, Cl. 72-334.000.

SKF Industrial Trading and Development Company B.V.: *See—*
Verburgh, Martin B.; and Pfeifle, Dieter, 4,691,092, Cl. 219-121.0LD.

Skinner, James R., to M. U. Engineering & Manufacturing, Inc. Rhodium coated mold. 4,690,370, Cl. 249-114.00R.

Skinner, Maurice W.: *See—*
Doroszkowski, Andrew; and Skinner, Maurice W., 4,690,837, Cl. 427-314.000.

Skinner, Robert L.: *See—*
Erwin, Douglas A.; and Skinner, Robert L., 4,691,295, Cl. 364-900.000.

Skipper, Claud, to Productive Instrument & Machine Inc. Fireplug anti-theft apparatus. 4,690,167, Cl. 137-382.000.

Skovhoj, Jens B. Lawn and garden maintenance apparatus. 4,689,940, Cl. 56-228.000.

Slettemoen, Gudmunn. Measuring and mapping vibrations. 4,689,993, Cl. 73-579.000.

Smart, Nancy M.; and Smart, Ricky B. Electric outlet and plug. 4,690,474, Cl. 439-120.000.

Smart, Ricky B.: *See—*
Smart, Nancy M.; and Smart, Ricky B., 4,690,474, Cl. 439-120.000.

Smigel, Irwin E. Method of manufacture of a toothpaste composition. 4,690,776, Cl. 252-315.300.

Smith, Elizabeth M.: *See—*
Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,691,049, Cl. 562-553.000.

Smith, Francis X.: *See—*
Ogunbiyi, Lai; and Smith, Francis X., 4,690,773, Cl. 252-174.120.

Smith, Harry D., Jr.: *See—*
Schultz, Ward E.; and Smith, Harry D., Jr., 4,691,102, Cl. 250-256.000.

Smith, James A.; and Murphy, Betty J., to Creative Products Resource Associates, Ltd. Towel for skin moisturizing and drying. 4,690,821, Cl. 424-401.000.

Smith, Joseph E., to V. W. Kaiser Engineering, Inc. Steering knuckle and kingpin assembly. 4,690,418, Cl. 280-96.100.

Smith, Kellen R.: *See—*
Smith, Quintin R.; and Smith, Kellen R., 4,690,319, Cl. 228-182.000.

Smith, Leon E. Twin matchbook. 4,690,273, Cl. 206-105.000.

Smith, Mark L.; and Wagner, Richard M., to AMP Incorporated. Selective plating apparatus. 4,690,747, Cl. 204-206.000.
Smith, Marlin R.: *See*—
George, Flint R.; and Smith, Marlin R., 4,690,227, Cl. 175-4.560.
Smith, Quintin R.; and Smith, Kellen R. Method of making complexly curved mold. 4,690,319, Cl. 228-182.000.
Smith, Robert K.: *See*—
Becke, Hans W.; and Smith, Robert K., 4,691,220, Cl. 357-39.000.
Smith, Robert S. Multipurpose rowing apparatus. 4,690,398, Cl. 272-72.000.
Smith, William A.: *See*—
Sanderson, John R.; Smith, William A.; Marquis, Edward T.; and Keating, Kenneth P., 4,691,034, Cl. 549-542.000.
Sanderson, John R.; Marquis, Edward T.; Smith, William A.; and Keating, Kenneth P., 4,691,035, Cl. 549-542.000.
Smiths Industries Public Limited Company: *See*—
Beckley, Keith A.; Jacob, Neil R.; and Trusler, Geoffrey A., 4,689,991, Cl. 73-304.00C.
Smoot, Michael A.; Barch, Herbert W.; and Das, Balbhadra, to PPG Industries, Inc. Novel cartridge with stress relieving member. 4,690,760, Cl. 210-321.500.
Smulders, Henricus J.: *See*—
Jansen, Gerardus L. M.; Smulders, Henricus J.; and Schuitmaker, Pieter D., 4,691,311, Cl. 369-100.000.
Snow, Wayne R.; Isliker, Gaston R.; and Johnson, Colin A., deceased (by Johnson, Barbara F., executor), to Allied Corporation. Tubular bi-metal connector. 4,690,480, Cl. 439-364.000.
Snyder, Keith A.: *See*—
Donson, William A.; Ellerson, James V.; Hammer, Richard B.; Lafer, William; and Snyder, Keith A., 4,690,833, Cl. 427-96.000.
Snyder, Robert S.: *See*—
Van Alstine, James M.; Harris, J. Milton; Shafer, Steve; Snyder, Robert S.; and Herren, Blair, 4,690,749, Cl. 204-299.00R.
Snyders, Robert V. Ventricular assist device. 4,690,134, Cl. 128-64.000.
Societa Cavi Pirelli S.p.A.: *See*—
Bortolin, Bruno; and Borgonovo, Sergio, 4,690,496, Cl. 350-96.210.
Occhini, Elio; and Bianchi, Giuseppe, 4,690,497, Cl. 350-96.230.
Priaroggia, Paolo G., 4,690,498, Cl. 350-96.230.
Societe Anonyme D.B.A.: *See*—
Couvez, Marc, 4,690,254, Cl. 188-73.360.
Societe Chimique des Charbonnages-CdF chimie: *See*—
Nardi, Alain; and Simier, Jean-Noel, 4,690,800, Cl. 422-40.000.
Societe d'Exploitation des Machines Dubuit: *See*—
Rouly, Eric; Dubuit, Jean-Louis; and Marette, Gilles, 4,690,050, Cl. 101-35.000.
Societe Nationale des Chemins de Fer Francais: *See*—
Turbe, Jean Pierre, 4,689,995, Cl. 73-636.000.
Societe Nationale des Poudres et Explosifs: *See*—
Granier, Georges; and Valliere, Yves, 4,690,063, Cl. 102-530.000.
Societe Nationale Elf Aquitaine: *See*—
Gauthier, Michel; and Fauteux, Denis, 4,690,840, Cl. 427-436.000.
Societe Nationale Elf Aquitaine (Production): *See*—
Arens, Georges; and Philippe, Staron, 4,691,306, Cl. 367-40.000.
Societe Nouvelle Baele Gangloff: *See*—
Braymand, Robert, 4,690,270, Cl. 198-774.000.
Sogabe, Ichita; Murata, Syuuji; and Yokoya, Yuji, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Rotary driving device used for rotary actuator. 4,691,135, Cl. 310-254.000.
Solarex Corporation: *See*—
Dickson, Charles R.; and Carlson, David E., 4,690,830, Cl. 427-38.000.
Solcz, Edward J.; Domoto, Gerald A.; and Wolf, Barry M., to Xerox Corporation. Piezoelectric optical beam deflector. 4,691,212, Cl. 346-108.000.
Solstad, Russell V., to VTC Incorporated. Integrated circuit packaging process. 4,689,875, Cl. 437-211.000.
Solvay & Cie. (Societe Anonyme): *See*—
Collart, Andre ; and Declerck, Fredy, 4,691,000, Cl. 528-244.000.
Dehennau, Claude; and Dubois, Paul, 4,690,628, Cl. 425-133.500.
Sonobe, Takashi: *See*—
Kagatani, Seiya; Hasumi, Shunji; Sonobe, Takashi; and Aruga, Masayoshi, 4,690,952, Cl. 514-808.000.
Sonoco Products Company: *See*—
Cannon, David C., 4,690,299, Cl. 220-402.000.
Sony Corporation: *See*—
Hayashi, Toshihide; Kanayama, Ikuo; and Kanno, Masayoshi, 4,691,351, Cl. 380-10.000.
Imakoshi, Shigeyoshi; Fukuyama, Munekatsu; Suyama, Hideo; and Souda, Yutaka, 4,691,259, Cl. 360-113.000.
Kanno, Masayoshi; Hideshima, Yasuhiro; Tsurumaru, Shinobu; and Kanayama, Ikuo, 4,691,236, Cl. 358-181.000.
Kumamoto, Kenichiro; Sato, Akira; Ohya, Koichi; and Matsuda, Koichi, 4,691,378, Cl. 455-301.000.
Maeda, Satoru; and Tao, Akihiko, 4,691,340, Cl. 379-96.000.
Nakada, Yasuo, 4,690,549, Cl. 356-4.000.
Souda, Yutaka: *See*—
Imakoshi, Shigeyoshi; Fukuyama, Munekatsu; Suyama, Hideo; and Souda, Yutaka, 4,691,259, Cl. 360-113.000.
Sourdillon-Airindex: *See*—
Lemonnier de Gouville, Jean B.; and Dane, Bernard, 4,690,636, Cl. 431-354.000.
Sourian & Cie.: *See*—
Mortier, Guy; and Chartrain, Jean-Claude, 4,690,596, Cl. 409-143.000.
South African Inventions Development Corporation: *See*—
Albers, Michel O.; and Singleton, Eric, 4,691,069, Cl. 585-259.000.
Southwestern Bell Telephone: *See*—
Stein, David E.; and Hammer, Donald R., 4,690,491, Cl. 350-96.160.
Spaeth, Lolita. Foldable quick pack for foodstuffs and the like. 4,690,321, Cl. 229-40.000.
Spaulding, Richard A.: *See*—
Hatch, Bruce O.; and Spaulding, Richard A., 4,691,094, Cl. 219-121.0PR.
Specialty Tool Co., Inc.: *See*—
Geise, Samuel C., 4,689,920, Cl. 51-241.00S.
Spector, George: *See*—
Schaffhauser, Brian E.; and Spector, George, 4,691,264, Cl. 361-232.000.
Spectra-Physics, Inc.: *See*—
Walker, Ray A., 4,690,556, Cl. 356-152.000.
Sperry Corporation: *See*—
Churchward, Reed R.; and Krocheski, Thomas L., 4,691,303, Cl. 365-222.000.
Splett, Katherine A.; and Howe, James A., 4,691,126, Cl. 307-441.000.
Spitaler, Englebert; and Wuerthner, Hubert, to TMC Corporation. Heel holder, in particular for a rental ski. 4,690,424, Cl. 280-633.000.
Splett, Katherine A.; and Howe, James A., to Sperry Corporation. Redundant synchronous clock system. 4,691,126, Cl. 307-441.000.
Sprague Electric Company: *See*—
Chalfin, Edward, 4,691,262, Cl. 361-56.000.
Springfield Wire, Inc.: *See*—
Beauregard, William W.; and Fessenden, Peter J., 4,689,878, Cl. 29-611.000.
Squires, Charles H.; Heefner, Donald L.; Evans, Ronald J.; Kopp, Beatrice J.; and Yarus, Michael J., to Synergen Associates, Inc. Method for transformation of anaerobic microorganisms. 4,690,897, Cl. 435-320.000.
Srock, Rainer: *See*—
Eger, Georg; and Srock, Rainer, 4,689,849, Cl. 16-82.000.
SS Pharmaceutical Co., Ltd.: *See*—
Sato, Susumu; Honda, Haruyoshi; Koumoto, Teruo; Isomae, Kazuo; Kuraishi, Tadayuki; and Katori, Tatsuhiko, 4,690,924, Cl. 514-237.000.
Staheli, Theodor, to Ciba-Geigy Corporation. Dispensing device for storing and applying at least one liquid or pasty substance. 4,690,306, Cl. 222-80.000.
Stahl, G. Allan: *See*—
Burns, Lyle D.; and Stahl, G. Allan, 4,690,219, Cl. 166-307.000.
Stamm, Richard H.: *See*—
Ritchie, Robert C.; McKone, Henry J.; and Stamm, Richard H., 4,690,789, Cl. 264-40.100.
Standard Oil Company, The: *See*—
Morrison, Donald L.; and Bartok, Stephen, 4,690,193, Cl. 160-133.000.
Valenyi, Louis J.; Pesa, Frederick A.; and Paparizos, Christos, 4,690,777, Cl. 252-373.000.
Velenyi, Louis J.; and Krupa, Andrew S., 4,690,814, Cl. 423-648.00R.
Standing, Anthony C. Combined energiser and reel for electric fences. 4,691,084, Cl. 191-12.20R.
Stanland, Andrew J.: *See*—
Chamberland, Roger R.; and Stanland, Andrew J., 4,690,482, Cl. 439-578.000.
Stanley, Frankie B., to Yarbrough, J. W., a part interest. Yarn drying and dye setting apparatus. 4,689,972, Cl. 68-20.000.
Stanley, Keith R.; and Winchell, David F., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method and apparatus for controlling a conference. 4,691,347, Cl. 379-203.000.
Stanley, Mervin D.: *See*—
Daghe, Joseph L.; Humes, Dennis W.; Stanley, Mervin D.; and Bouc, Gary L., 4,690,019, Cl. 81-99.000.
Stannard, James P.; and Shockley, Charles W., to Pneumatic Pipewipers, Inc. Pneumatic pipe wiper system. 4,690,213, Cl. 166-84.000.
Stanton, David J.: *See*—
Rise, Mark T.; and Stanton, David J., 4,690,144, Cl. 128-419.00R.
Stapfer, Jakob: *See*—
Lattion, Andre; Bischofberger, Jurg; Salvik, Walter; Stapfer, Jakob; and Schreiber, Manfred, 4,689,945, Cl. 57-263.000.
Starkey, Stanley V.: *See*—
Gayfer, David; Starkey, Stanley V.; and Wareham, John G., 4,690,265, Cl. 198-347.000.
Starzewski, Karl-Heinz A. O.; Witte, Josef; and Bartl, Herbert, to Bayer Aktiengesellschaft. Organic nickel compounds, the production thereof and the use thereof as polymerization catalysts. 4,691,036, Cl. 556-16.000.
Starzmann, Martin, to Molnlycke AB. Substantially triangular surgical drape. 4,690,137, Cl. 128-132.00D.
State University of New York, The: *See*—
Simko, Vlado, 4,690,820, Cl. 424-128.000.
Statz, Robert J., to Du Pont de Nemours, E. I., and Company. Ionomers having improved low temperature properties. 4,690,981, Cl. 525-329.600.
STC plc: *See*—
Redman, Michael J.; Wong, Ming K.; and Sugden, Peter R., 4,691,339, Cl. 379-62.000.
Steele, Douglas S., to General Electric Company. Ionization detector. 4,691,108, Cl. 250-385.000.
Stegmann, Werner, to Ciba-Geigy Corporation. Process for producing 1-hydroxy ketones. 4,691,058, Cl. 568-316.000.

Stein, David E.; and Hammer, Donald R., to Southwestern Bell Telephone. Building data transmission system. 4,690,491, Cl. 350-96.160.

Stein Industrie: *See—*
Vidal, Jean; Malaubier, Francois; and Mevel, Jean-Claude, 4,690,075, Cl. 110-264.000.

Stein, Ross L.: *See—*
Dutta, Anand S.; Stein, Ross L.; Trainor, Diane A.; and Wildonger, Richard A., 4,691,007, Cl. 530-331.000.

Steinberger, Ned, to Steinberger Sound Corporation. String clamping device. 4,690,028, Cl. 84-314.00N.

Steinberger Sound Corporation: *See—*
Steinberger, Ned, 4,690,028, Cl. 84-314.00N.

Steinemann, Robert, to Georg Fischer Aktiengesellschaft. Method and apparatus for regulating fluid flow. 4,690,163, Cl. 137-8.000.

Steirische Kettenfabriken Pengg-Walenta KG: *See—*
Jeindl, Ferdinand, 4,690,190, Cl. 152-213.00A.

Stemco, Inc.: *See—*
Gregorich, Edward E.; and Maher, Timothy R., 4,690,245, Cl. 181-272.000.

Stemcor Corporation: *See—*
Bates, Carl H., 4,690,790, Cl. 264-63.000.

Stephany, Joseph F., to Xerox Corporation. Matrix display with a fast cursor. 4,691,200, Cl. 340-784.000.

Stephen, John F.: *See—*
Nelson, Richard V.; and Stephen, John F., 4,690,963, Cl. 524-98.000.

Stephenson, Jeff: *See—*
Ell, Travis E.; and Stephenson, Jeff, 4,691,152, Cl. 318-616.000.

Steridyne Corporation: *See—*
Poncy, Richard P.; and Chrzanowski, Mathew, 4,690,457, Cl. 297-337.000.

Sterling, Edward L., Jr.; and Thompson, William L., to Babcock & Wilcox Company, The. On-line serial communication interface from a computer to a current loop. 4,691,328, Cl. 375-36.000.

Stern, Richard A.; and Babbitt, Richard W., to United States of America, Army. Ferrite wavegnide scanning antenna. 4,691,208, Cl. 343-785.000.

Stern, Richard M., to Riker Laboratories, Inc. Intermediates for the preparation of 8,9-dihalobenzo[i]quinolizine carboxylic acids. 4,691,016, Cl. 546-95.000.

Stessen, Lothar, to DIEHL GmbH & Co. Impulse propulsion unit. 4,689,845, Cl. 60-228.000.

Stevens, Donn E.: *See—*
Shawcross, Alfred L.; Stevens, Donn E.; and Jones, Robert E., 4,690,520, Cl. 350-517.000.

Stevens, Michael G.: *See—*
Hoffman, Dwight K.; Stevens, Michael G.; and Messick, Virginia B., 4,690,988, Cl. 525-502.000.

Stevens, Vernon C., to Ohio State University. Antigenic modification of polypeptides. 4,691,006, Cl. 530-324.000.

Stevermuer, Heinrich: *See—*
Lotz, Alexander; and Stevermuer, Heinrich, 4,690,753, Cl. 209-496.000.

Stiefel, Jakob. Roll cutting machine for comminution of bulky refuse. 4,690,337, Cl. 241-36.000.

Stilling, Johann. Replaceable awning. 4,690,192, Cl. 160-57.000.

Stoffel, James C.; and Tandon, Jagdish C., to Xerox Corporation. Method and apparatus for fabricating full width scanning arrays. 4,690,391, Cl. 269-21.000.

Stolar, Inc.: *See—*
Stolarczyk, Larry G., 4,691,166, Cl. 324-334.000.

Stolarczyk, Larry G., to Stolar, Inc. Electromagnetic instruments for imaging structure in geologic formations. 4,691,166, Cl. 324-334.000.

Stolz, Robert: *See—*
Olschewski, Armin; Hetterich, Hermann; Horling, Peter; and Stolz, Robert, 4,689,982, Cl. 72-334.000.

Stone, Earlyn W. Dispensing receptacle for drafting equipment. 4,690,285, Cl. 211-41.000.

Stoner, Eugene M., to ARES, Inc. Breech/receiver assembly for automatic cannons. 4,690,032, Cl. 89-43.010.

Storer, Richard: *See—*
Knight, David J.; Scopes, David I. C.; Storer, Richard; and Holman, Stuart, 4,690,917, Cl. 514-23.000.

Strachan, John S., to Syrinx Innovations Limited. Rotation rate sensor. 4,689,992, Cl. 73-505.000.

Stratton, John F., to Lucas Industries public limited company. Combustion equipment. 4,689,961, Cl. 60-748.000.

Straubel, Max: *See—*
Linder, Ernst; Rembold, Helmut; Straubel, Max; and Teegen, Walter, 4,690,373, Cl. 251-129.020.

Strausburg, Larry D.: *See—*
Hamisch, Paul H., Jr.; Makley, James A.; Pabodie, Robert M.; and Strausburg, Larry D., 4,690,317, Cl. 227-67.000.

Stricker, David J.: *See—*
Friedman, Walter; and Stricker, David J., 4,690,656, Cl. 446-95.000.

Strippit/Di-Acro-Houdaille, Inc.: *See—*
Clark, Stephen C., 4,690,021, Cl. 83-71.000.

Struger, Odo J., to Allen-Bradley Company, Inc. Method and apparatus for exchanging multiple data bytes with an I/O module in a single scan. 4,691,296, Cl. 364-900.000.

Stuart, Van I. W.: *See—*
Wang, Pen C.; Stuart, Van I. W.; Yates, Ronald L.; and Crain, Steven P., 4,691,021, Cl. 548-309.000.

Suchowski, Bernard, to Hartz Mountain Corporation, The. Hook. 4,689,860, Cl. 24-239.000.

Suciu, George D.; and Paustian, John E. Process for preventing backmixing in a fluidized bed vessel. 4,691,031, Cl. 549-258.000.

Suda, Yoshio: *See—*
Sato, Masaaki; Tanaka, Susumu; Kaeriyama, Kyoji; and Suda, Yoshio, 4,691,005, Cl. 528-380.000.

Sugarbaker, Paul H.: *See—*
Lyddy, James E., Jr.; Penland, William Z.; and Sugarbaker, Paul H., 4,690,131, Cl. 128-4.000.

Sugawara, Toshiyuki: *See—*
Mochida, Ei; Shinkai, Hiroyuki; Kudo, Takashi; and Sugawara, Toshiyuki, 4,690,908, Cl. 436-518.000.

Sugden, Peter R.: *See—*
Redman, Michael J.; Wong, Ming K.; and Sugden, Peter R., 4,691,339, Cl. 379-62.000.

Sugg, Basil R.: *See—*
Davies, William L.; Hahn, Clive E. W.; Jackson, Roy K.; McGraghan, Thomas A.; Palayiwa, Eileen; and Sugg, Basil R., 4,690,562, Cl. 356-361.000.

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Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Oizumi, Kiyoshi, 4,690,211, Cl. 165-177.000.

Sugisawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, to House Food Industrial Co., Ltd. Apparatus for producing sterile air. 4,690,699, Cl. 55-267.000.

Sugiura, Fumio: *See—*
Chiba, Yoshinori; Ishida, Keiichi; and Sugiura, Fumio, 4,690,456, Cl. 297-284.000.

Sugiura, June: *See—*
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,691,298, Cl. 365-189.000.

Sugiyama, Shuji; Syohda, Shuji; and Kuniyoshi, Shinji, to Hitachi, Ltd. Optical exposer. 4,690,529, Cl. 353-122.000.

Sulzer Brothers Limited: *See—*
Lauer, Fredy, 4,690,600, Cl. 411-263.000.

Suman, Michael J.: *See—*
Boerema, Edward T.; Suman, Michael J.; and Fleming, Dennis J., 4,690,450, Cl. 296-97.00K.

Sumida, Seizo: *See—*
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, 4,690,709, Cl. 71-120.000.

Sumitomo Chemical Company, Limited: *See—*
Nakamatsu, Toshio; Matsuo, Yoshikazu; Nishikuri, Masao; and Imada, Kunihiko, 4,690,686, Cl. 8-638.000.
Shirafuji, Tamio; and Kawata, Itaru, 4,691,064, Cl. 568-835.000.
Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, 4,690,946, Cl. 514-485.000.
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, 4,690,709, Cl. 71-120.000.

Sumitomo Electric Industries, Ltd.: *See—*
Takahashi, Shinichiro; and Isshiki, Isao, 4,691,330, Cl. 377-39.000.

Sumitomo Pharmaceuticals Company, Limited: *See—*
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yuusuke; and Joshita, Yutaka, 4,690,949, Cl. 514-561.000.

Sumitomo Special Metals Co., Ltd.: *See—*
Wada, Toshiaki; Katsuyama, Yoshiaki; and Nakaoka, Junichi, 4,690,846, Cl. 428-64.000.

Sumiya, Koji; Watanabe, Kazuaki; and Kubo, Seitoku, to Aisin-Warner Limited; and Toyota Jidosha Kabushiki Kaisha. Hydraulic servo for friction coupling element of automatic transmission. 4,690,037, Cl. 92-130.00R.

Sumner, Cyril R., to Halliburton Company. Method for depth control and detonation of tubing conveyed gun assembly. 4,690,218, Cl. 166-297.000.

Sun Chemical Corporation: *See—*
Janusz, Edward G., 4,690,712, Cl. 106-30.000.

Sun, Robert Li-Jiun: *See—*
Kammerer, Gene W.; Yoon, Hee K.; and Sun, Robert Li-Jiun, 4,690,842, Cl. 428-35.000.

Sun Seiki Co., Ltd.: *See—*
Kubota, Takao; and Ujii, Yasuo, 4,690,535, Cl. 354-322.000.

Sunaga, Sohsuke: *See—*
Masuda, Naosuke; and Sunaga, Sohsuke, 4,689,983, Cl. 72-356.000.

Sundquist, Glen. Water heater and distiller apparatus. 4,690,102, Cl. 122-13.00R.

Sunds Defibrator Aktiebolag: *See—*
Hartler, Nils J. C.; Lekander, Karl-Erik; Sjodin, Lars T.; and Mjoberg, Per J., 4,690,731, Cl. 162-45.000.

Sundstrand Corporation: *See—*
Dobbs, Daniel R., 4,690,085, Cl. 114-20.200.
Hayden, Howard L.; Vaghani, Vallabh V.; and Readman, John, 4,690,470, Cl. 439-13.000.
Niggemann, Richard; and Readman, John, 4,690,210, Cl. 165-159.000.

Super Sack Manufacturing Corporation: *See—*
Derby, Norwin C., 4,691,371, Cl. 383-62.000.

Superior Manufacturing & Instrument Corporation: *See—*
Moscovici, Poldi, 4,691,275, Cl. 363-143.000.

Support Technologies, Inc.: *See*—
Phillips, Charles R., 4,691,316, Cl. 371-20.000.

Susko, John R.: *See*—
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,690,962, Cl. 524-94.000.

Sussman, Howard. Containers for cosmetic sundries. 4,690,276, Cl. 206-36.00X.

Sutherland, James F.: *See*—
Kenny, Thomas J.; and Sutherland, James F., 4,691,263, Cl. 361-58.000.

Suyama, Hideo: *See*—
Imakoshi, Shigeyoshi; Fukuyama, Munekatsu; Suyama, Hideo; and Souda, Yutaka, 4,691,259, Cl. 360-113.000.

Suyama, Takahiro: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,691,214, Cl. 357-17.000.

Suzuki, Akimitsu; Awaji, Toshio; and Igari, Kozaburo, to NSK-Warner Kabushiki Kaisha. Speed responsive centrifugal clutch with a serial circumferential arrangement of shoe assemblies and dampers. 4,690,257, Cl. 192-3.310.

Suzuki, Hideyuki; Terada, Katsunori; Masaki, Yuichi; and Morimoto, Kenji, to Canon Kabushiki Kaisha. Pattern forming method. 4,690,880, Cl. 430-313.000.

Suzuki, Masaharu: *See*—
Tanji, Hiroaki; Suzuki, Masaharu; Nomura, Kenji; Watanabe, Shojiro; and Kawasaki, Takashi, 4,690,841, Cl. 428-35.000.

Suzuki, Masanobu: *See*—
Watanabe, Hiroshi; Johzuka, Takashi; and Suzuki, Masanobu, 4,691,376, Cl. 455-131.000.

Suzuki, Masanori: *See*—
Yamaguchi, Yoshimitsu; Shibata, Tadahiko; Suzuki, Masanori; and Toda, Takezi, 4,690,349, Cl. 242-75.500.

Suzuki, Masayuki: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,690,532, Cl. 354-173.110.

Suzuki, Shigeharu: *See*—
Narutani, Tetsu; and Suzuki, Shigeharu, 4,690,798, Cl. 420-61.000.

Suzuki, Soichi; Aihara, Mitsuo; and Fujii, Mitsuo, to Kabushiki Kaisha Toshiba. IC device and a system for testing the same. 4,691,287, Cl. 364-490.000.

Suzuki, Toshiyuki: *See*—
Hata, Takehisa; Kanagawa, Nobuto; Morishita, Takashi; and Suzuki, Toshiyuki, 4,690,816, Cl. 424-456.000.

Suzuki, Yukio, to U.S. Philips Corporation. Magazine for discs in holders, and combination of a disc-player with such a magazine. 4,691,309, Cl. 369-38.000.

Svenska Traforskningsinstitutet: *See*—
Herngren, Torbjorn; and Lofthus, Jon, 4,690,634, Cl. 431-8.000.
Rydefalk, Staffan; and Einarsson, Jens, 4,689,988, Cl. 73-61.00R.

Swain, Danny C., to Advanced Control Engineering. Filter pump head assembly. 4,690,621, Cl. 417-313.000.

Swaine, Robert L., Jr.: *See*—
Kupper, Philip L.; Moore, Katherine L.; and Swaine, Robert L., Jr., 4,690,827, Cl. 426-548.000.

Swanson, Roy T., to S&C Electric Company. High voltage interrupting switch with improved contact connection arrangement and method. 4,691,085, Cl. 200-151.000.

Swiech, Matthew J.: *See*—
Munyon, Gary D.; and Swiech, Matthew J., 4,690,053, Cl. 101-328.000.

Swiss Aluminium Ltd.: *See*—
Rieger, Wolfhart; Gauckler, Ludwig; Maurer, Albert; and Kampfer, Konrad, 4,690,763, Cl. 210-496.000.

Synergen Associates, Inc.: *See*—
Squires, Charles H.; Heefner, Donald L.; Evans, Ronald J.; Kopp, Beatrice J.; and Yarus, Michael J., 4,690,897, Cl. 435-320.000.

Synergist Limited: *See*—
Gerow, Frank J., 4,690,135, Cl. 128-79.000.

Syntex (U.S.A.) Inc.: *See*—
Fried, John H.; and Venuti, Michael C., 4,690,925, Cl. 514-267.000.
Nestor, John J., Jr.; and Vickery, Brian, 4,690,916, Cl. 514-15.000.

Synthelabo: *See*—
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, 4,690,931, Cl. 514-317.000.

Syohda, Shuji: *See*—
Sugiyama, Shuji; Syohda, Shuji; and Kuniyoshi, Shinji, 4,690,529, Cl. 353-122.000.

Syracuse University: *See*—
Friedman, Alexander A.; and Podolak, Peter L., 4,690,755, Cl. 210-96.100.

Syrinx Innovations Limited: *See*—
Strachan, John S., 4,689,992, Cl. 73-505.000.

Sze, Benjamin C., to Du Pont de Nemours, E. I., and Company. Uniform polymeric filaments. 4,691,003, Cl. 528-308.100.

Szedlmajer, Laszlo. Method and apparatus including spaced antennas for determining the trace and depth of underground metallic conductors. 4,691,165, Cl. 324-326.000.

Szporny, Laszlo : *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Osaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

T.A.S., Inc.: *See*—
Sayler, William H.; and White, Justin C., 4,690,338, Cl. 241-56.000.

Taggart, Davis L.; and Heffern, Edward W., to Amoco Corporation. Process for water injectivity improvement treatment of water injection wells. 4,690,217, Cl. 166-274.000.

Taguchi, Katsuhiko, to Tokyo Juki Industrial Co., Ltd. Dust protection apparatus for a magnetic disc drive. 4,691,257, Cl. 360-97.000.

Taguchi, Masao: *See*—
Suginawa, Ko; Sekiguchi, Kazuya; Taguchi, Masao; Nakatani, Masayuki; and Iwata, Hitoshi, 4,690,699, Cl. 55-267.000.

Tajiri, Noriyuki: *See*—
Sugimori, Terahiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,690,974, Cl. 525-64.000.
Sugimori, Teruhiko; Tajiri, Noriyuki; and Fukuda, Yutaro, 4,690,975, Cl. 525-64.000.

Takada, Ikunori, to Mitsubishi Denki Kabushiki Kaisha. Planar semiconductor device with dual conductivity insulating layers over guard rings. 4,691,224, Cl. 357-53.000.

Takada, Kazuyoshi, to Yamaha Hatsudoki Kabushiki Kaisha. Stabilizing means for snowmobile. 4,690,234, Cl. 180-182.000.

Takada, Susumu; Sasatani, Takashi; Shindo, Hirohisa; Matsushita, Akira; and Eigyo, Masami, to Shionogi & Co., Ltd. Pyrazolo[4,3-c]quinoline-3-one and imidazo[4,3-c]cinnolin-3-one derivatives and their use as psychotropic agents. 4,690,930, Cl. 514-293.000.

Takagi, Akihiro; and Kimoto, Kiyoshi, to Nippon Kogaku K. K. Apparatus for reproducing information from magnetooptical recording medium. 4,691,308, Cl. 369-13.000.

Takagi, Satoshi: *See*—
Hasegawa, Isao; Yoshikawa, Kikuo; Takagi, Satoshi; and Takahashi, Akira, 4,691,261, Cl. 360-137.000.

Takahashi, Akira: *See*—
Hasegawa, Isao; Yoshikawa, Kikuo; Takagi, Satoshi; and Takahashi, Akira, 4,691,261, Cl. 360-137.000.

Takahashi, Hideaki: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,691,298, Cl. 365-189.000.

Takahashi, Hiroshi: *See*—
Naritomi, Yasuhisa; Takahashi, Hiroshi; and Shiba, Keisuke, 4,690,886, Cl. 430-303.000.

Takahashi, Junya; Kato, Toshiro; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. Fungicidal N-phenylcarbamates. 4,690,946, Cl. 514-485.000.

Takahashi, Keishi: *See*—
Kobayashi, Masashi; Takahashi, Keishi; and Yoneyama, Kimiya, 4,691,258, Cl. 360-97.000.

Takahashi, Kenji: *See*—
Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Oizumi, Kiyoshi, 4,690,211, Cl. 165-177.000.

Takahashi, Kiyofumi: *See*—
Tomibe, Shinji; Gomibuchi, Reizo; Takahashi, Kiyofumi; and Kato, Noboru, 4,690,854, Cl. 428-195.000.

Takahashi, Masaaki: *See*—
Murakami, Susumu; Kagami, Teruyuki; Yatsuo, Tsutomu; and Takahashi, Masaaki, 4,691,223, Cl. 357-51.000.

Takahashi, Nobutaka, to Nissan Motor Company, Limited. System for controlling an internal combustion engine and method therefor. 4,690,116, Cl. 123-425.000.

Takahashi, Sadatoshi; and Tanaka, Tsunefumi, to Canon Kabushiki Kaisha. Wide angle high range zoom lens. 4,690,513, Cl. 350-427.000.

Takahashi, Shinichiro; and Isshiki, Isao, to Sumitomo Electric Industries, Ltd. Duty control circuit for gradually reducing the duty time. 4,691,330, Cl. 377-39.000.

Takahashi, Takehiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Stamping device having identical mount bases for rotatably supporting a cutting tool and an anvil. 4,690,022, Cl. 83-308.000.

Takahashi, Tokuyuki; Kuramochi, Koujiro; and Sayou, Syoichi, to Toyota Jidosha Kabushiki Kaisha. Control system for intermediate differential in four-wheel drive vehicle. 4,690,239, Cl. 180-249.000.

Takahashi, Yoshinobu: *See*—
Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,690,097, Cl. 118-723.000.

Takahashi, Yukio: *See*—
Sakakibara, Yuichi; Takahashi, Yukio; and Shima, Hideharu, 4,691,140, Cl. 313-486.000.

Takai, Kiyoshi; and Kaseya, Akinori, to Godo Steel, Ltd. Hot gunning robot for furnace lining. 4,690,327, Cl. 239-226.000.

Takamatsu, Toshiaki; Kuwagaki, Hiroshi; Minezaki, Shigehiro; Yamamoto, Kunihiko; Nakatani, Hiroshi; and Kawaguchi, Hisao, to Sharp Kabushiki Kaisha. Structure and method of connecting terminals of matrix display units. 4,690,510, Cl. 350-334.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; and Kuriyama, Takashi, to Victor Company of Japan, Ltd. Color imaging apparatus having a 1:2 frequency ratio between video and reference signals for high S/N color demodulation. 4,691,227, Cl. 358-47.000.

Takao, Kenji, to Rheon Automatic Machinery Co., Ltd. Apparatus for transferring shaped articles. 4,690,269, Cl. 198-460.000.

Takasago Perfumery Co., Ltd.: *See*—
Yoshikawa, Sadao; Saburi, Masahiko; Ikariya, Takao; Ishii, Youichi; and Akutagawa, Susumu, 4,691,037, Cl. 556-18.000.

Takata, Nobuharu, to Mitsubishi Denki Kabushiki Kaisha. Variable frequency power unit controlling system. 4,691,156, Cl. 318-798.000.

Takayama, Nobutoshi: *See*—
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,691,256, Cl. 360-73.000.

Takeda, Hitoshi, to Nissan Motor Co., Ltd. Method and apparatus for alleviating transmission shift shocks. 4,691,285, Cl. 364-424.100.

Takeda, Kenji; Inagaki, Mitsuo; Sasaya, Hideaki; and Matsui, Kazuma, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Antiskid hydraulic pressure modulator for vehicle hydraulic braking system. 4,690,465, Cl. 303-119.000.

Takeda, Kyoji; and Kitai, Akira, to Tanaka Seiki Co., Ltd. Tape winding machine. 4,690,346, Cl. 242-56.00R.

Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. Urea derivatives, and their use as herbicides. 4,690,709, Cl. 71-120.000.

Takeyama, Yutaka: *See*—
Kiyono, Yasuhiro; and Takeyama, Yutaka, 4,691,116, Cl. 307-10.00R.

Takezawa, Yoshio; and Akatsu, Tatsuo, to Toray Industries, Inc. Polyphenylene sulfide resin compositions and their moldings. 4,690,969, Cl. 524-413.000.

Taki, Koichi: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.

Takigawa, Toshimichi: *See*—
Sasano, Ryoichiro; Toyohara, Tsutomu; and Takigawa, Toshimichi, 4,690,020, Cl. 82-2.00D.

Takimoto, Hiroyuki: *See*—
Kozuki, Susumu; Takimoto, Hiroyuki; Edakubo, Hiroo; and Takayama, Nobutoshi, 4,691,256, Cl. 360-73.000.

Takubo, Hiroichi: *See*—
Kohno, Kouji; Takubo, Hiroichi; and Ito, Toshinobu, 4,690,111, Cl. 123-192.00B.

Talon, Inc.: *See*—
MacFee, Norman W., 4,691,370, Cl. 383-61.000.

Tamai, Yasuo: *See*—
Shirahata, Ryuji; and Tamai, Yasuo, 4,690,857, Cl. 428-216.000.

Tamura, Takahiro: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.

Tanabe, Takeshi: *See*—
Shin, Yasuo; and Tanabe, Takeshi, 4,691,186, Cl. 338-34.000.

Tanaka, Fusatoshi: *See*—
Nakayama, Hideo; Nakatani, Shuichi; Tanaka, Fusatoshi; and Hanafusa, Hiroyuki, 4,690,106, Cl. 123-52.00M.

Tanaka, Itsuo: *See*—
Goto, Tokuju; Tanaka, Itsuo; Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,691,137, Cl. 313-30.000.

Tanaka, Katsuhiko: *See*—
Murata, Michihiro; Tanaka, Katsuhiko; and Seto, Hiroyuki, 4,691,104, Cl. 250-338.000.

Tanaka Seiki Co., Ltd.: *See*—
Takeda, Kyoji; and Kitai, Akira, 4,690,346, Cl. 242-56.00R.

Tanaka, Susumu: *See*—
Sato, Masaaki; Tanaka, Susumu; Kaeriyama, Kyoji; and Suda, Yoshio, 4,691,005, Cl. 528-380.000.

Tanaka, Tsunefumi: *See*—
Takahashi, Sadatoshi; and Tanaka, Tsunefumi, 4,690,513, Cl. 350-427.000.

Tandon, Jagdish C.: *See*—
Stoffel, James C.; and Tandon, Jagdish C., 4,690,391, Cl. 269-21.000.

Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; Holloway, Thomas C.; and Bell, David A., to Texas Instruments Incorporated. Oxide-capped titanium silicide formation. 4,690,730, Cl. 156-643.000.

Tang, Wen-Tsung F.: *See*—
Schnizlein, Paul G.; and Tang, Wen-Tsung F., 4,691,122, Cl. 307-279.000.

Tangberg Data A/S: *See*—
Helgeland, Olav, 4,690,362, Cl. 248-404.000.

Tanigaki, Katsumi; and Iida, Yasuo, to NEC Corporation. Positive acting resist material comprised of novoloc resin derived from phenylphenol. 4,690,882, Cl. 430-192.000.

Taniguchi, Hiroji; Iwatsuki, Kunihiro; and Shindou, Yoshio, to Toyota Jidosha Kabushiki Kaisha. Shift control system of automatic transmission. 4,690,017, Cl. 74-866.000.

Taniguchi, Nobuyuki: *See*—
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, 4,690,536, Cl. 354-402.000.

Tanimoto, Akikazu; and Imamura, Kazunori, to Nippon Kogaku K. K. Projection exposure apparatus. 4,690,528, Cl. 353-101.000.

Tanimoto, Hirotoshi: *See*—
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, 4,691,053, Cl. 562-531.000.

Tanji, Hiroaki; Suzuki, Masaharu; Nomura, Kenji; Watanabe, Shojiro; and Kawasaki, Takashi, to Denki Kagaku Kogyo Kabushiki Kaisha. Pyrolytic boron nitride article. 4,690,841, Cl. 428-35.000.

Tao, Akihiko: *See*—
Maeda, Satoru; and Tao, Akihiko, 4,691,340, Cl. 379-96.000.

Tasbas, Hedy E.: *See*—
Coleman, Mary T.; and Tasbas, Hedy E., 4,690,671, Cl. 604-12.000.

Tavis, John R. Variable-reluctance transducer. 4,690,004, Cl. 73-862.640.

Taylor, Bruce F.; and Hagen, Kenneth G., to Thermo Electron-Web Systems, Inc. Evaporative-cooling apparatus and method for the control of web or web-production machine component surface temperatures. 4,689,895, Cl. 321-20.000.

Taylor, David, to BIP Chemicals, Ltd. Process for making solid urea-formaldehyde resins. 4,691,001, Cl. 528-256.000.

Taylor, Douglas B., to Cooper Cliff Door Manufacturing (1980) Ltd. Apparatus for opening and closing industrial door. 4,690,195, Cl. 160-310.000.

Taylor, James F. Boat with changeable configuration hull. 4,690,094, Cl. 114-284.000.

Taylor, John D.; and Honn, Kenneth V., to Wayne State University. Inhibition of tumor growth and metastasis with calcium channel blocker compounds. 4,690,935, Cl. 514-356.000.

Taylor, John E.; and Keene, Ian W., to BICC Public Limited Company. Optical fibre element housed in a tube resiliently set in a form such that its longitudinal axis follows a path greater than the rectilinear distance between points to be connected. 4,690,499, Cl. 350-96.230.

Taylor, Lyn P.: *See*—
Ross, Sidney A.; and Taylor, Lyn P., 4,690,142, Cl. 128-419.00R.

Taylor, Noel R.; and Taylor, Paul A. Automatic load seeking control for a motor. 4,691,155, Cl. 318-771.000.

Taylor, Paul A.: *See*—
Taylor, Noel R.; and Taylor, Paul A., 4,691,155, Cl. 318-771.000.

TDK Corporation: *See*—
Narumiya, Yoshikazu; Hashimoto, Yasuo; Yui, Hiroshi; and Kageyama, Yoshiteru, 4,690,778, Cl. 252-506.000.

Teac Corporation: *See*—
Sakai, Yoshiaki; and Tsuyuguchi, Hiroshi, 4,691,255, Cl. 360-69.000.

Technical Oil Tools Corporation: *See*—
Jobe, Tommy L., 4,691,384, Cl. 455-602.000.

Teegen, Walter: *See*—
Linder, Ernst; Rembold, Helmut; Straubel, Max; and Teegen, Walter, 4,690,373, Cl. 251-129.020.

Teijin Limited: *See*—
Kumakawa, Shiro; and Yamamoto, Kazuyuki, 4,690,866, Cl. 428-364.000.

Teijin Seiki Company Limited: *See*—
Matsumoto, Kazuyuki; Hashimoto, Mashataka; and Iwata, Michiyoshi, 4,690,010, Cl. 74-469.000.

Tektronix, Inc.: *See*—
Nelson, Theodore G.; and Diller, Calvin D., 4,691,174, Cl. 330-260.000.
Theus, John G., 4,691,121, Cl. 307-269.000.

Teledyne Industries, Inc.: *See*—
Keetley, Reginald G.; and Allen, Keith, 4,690,614, Cl. 416-43.000.

Tell, Elaine N.; and Veltman, Preston L., to National Medical Care. Sterilant compositions. 4,690,772, Cl. 252-106.000.

Telorsck, Gerhard, to Siemens Aktiengesellschaft. Primary radiation diaphragm for X-ray diagnostics devices. 4,691,335, Cl. 378-152.000.

Temp. Systems, Inc.: *See*—
Theiss, John J.; and Durst, Paul T., 4,691,097, Cl. 219-513.000.

Temperilli, Aldemio: *See*—
Bernardi, Luigi; Chiodini, Laura; Mantegani, Sergio; Ruggieri, Daniela; Temperilli, Aldemio; and Salvati, Patricia, 4,690,929, Cl. 514-288.000.

Tendapak Holdings Pty. Limited: *See*—
Gibson, Royce G., 4,689,856, Cl. 17-32.000.

Tenenbaum, David M. Noise elimination system for pictures and the like. 4,691,343, Cl. 379-100.000.

Tentsova, Antonina I.: *See*—
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.

Terada, Katsunori: *See*—
Suzuki, Hideyuki; Terada, Katsunori; Masaki, Yuichi; and Morimoto, Kenji, 4,690,880, Cl. 430-313.000.

Terada, Yasushi; and Nakayama, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device. 4,691,216, Cl. 357-23.600.

Terae, Nobuyuki; Yamaya, Masaaki; and Okada, Fumio, to Shin-Etsu Chemical Co., Ltd. Antifoam composition. 4,690,713, Cl. 106-287.160.

Terakawa, Takashige: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,690,156, Cl. 128-804.000.

Teramoto, Tsutomu: *See*—
Utsunomiya, Shunji; Teramoto, Tsutomu; and Huruta, Tadashi, 4,690,151, Cl. 128-682.000.

Teraoka, Masao; and Yuhashi, Yukio, to Tochigifujisangyo Kabushikigaisha. Hydraulic power transmission device with centrifugally actuated clutch override. 4,690,258, Cl. 192-58.00C.

Termohlen, David E. Drilling pipe for downhole drill motor. 4,690,212, Cl. 166-65.100.

Terumo Kabushiki Kaisha: *See*—
Katsura, Yoshiro, 4,690,762, Cl. 210-436.000.

Tervamaki, Jukka; and Jarvimaki, Kari, to Labstystems Oy. Diluting dosage device. 4,690,005, Cl. 73-864.120.

Teschner, Eckart: *See*—
Hesse, Wolfgang; Settelmeyer, Richard; and Teschner, Eckart, 4,690,692, Cl. 51-293.000.

Texaco Inc.: *See*—
Duranleau, Roger G.; Nieh, Edward C. Y.; and Knifton, John F., 4,691,041, Cl. 558-277.000.
Petter, Karl H.; and Robbins, Gregory K., 4,690,587, Cl. 405-211.000.

Sanderson, John R.; Smith, William A.; Marquis, Edward T.; and Keating, Kenneth P., 4,691,034, Cl. 549-542.000.
Sanderson, John R.; Marquis, Edward T.; Smith, William A.; and Keating, Kenneth P., 4,691,035, Cl. 549-542.000.

Texas Instruments Incorporated: *See*—
Anderson, Daniel F., 4,691,301, Cl. 365-200.000.
Douglas, Monte A., 4,690,729, Cl. 156-643.000.
Levine, Jules D.; Jensen, Millard J.; and Haney, Ronald E., 4,691,076, Cl. 136-250.000.
Malhi, Satwinder D. S., 4,689,871, Cl. 437-40.000.
Roll, Walter F.; and Campbell, Michael, 4,690,486, Cl. 350-6.600.
Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; Holloway, Thomas C.; and Bell, David A., 4,690,730, Cl. 156-643.000.
Thaden, Robert C.; and Watts, Mark W., 4,691,289, Cl. 364-518.000.

Texas Iron Works, Inc.: *See*—
Braddick, Britt O., 4,690,220, Cl. 166-382.000.

Thaden, Robert C.; and Watts, Mark W., to Texas Instruments Incorporated. State machine standard cell that supports both a Moore and a Mealy implementation. 4,691,289, Cl. 364-518.000.

Thalmann, Theo; and Oesterle, Gerhard, to Aktiengesellschaft Adolph Saurer. Back rest arrangement on a weaving machine. 4,690,176, Cl. 139-110.000.

Theiss, John J.; and Durst, Paul T., to Temp. Systems, Inc. Fail safe safety control device. 4,691,097, Cl. 219-513.000.

Thermal Dynamics Corporation: *See*—
Hatch, Bruce O.; and Spaulding, Richard A., 4,691,094, Cl. 219-121.0PR.

Thermo Electron-Web Systems, Inc.: *See*—
Taylor, Bruce F.; and Hagen, Kenneth G., 4,689,895, Cl. 321-20.000.

Theus, John G., to Tektronix, Inc. Digital free-running clock synchronizer. 4,691,121, Cl. 307-269.000.

Thiebaud, Marius. Automatic regulating valve of the air flow sucked out of a room through a mechanical ventilating installation. 4,690,372, Cl. 251-129.100.

Thinking Machines Corporation: *See*—
Wolfram, Stephen, 4,691,291, Cl. 364-717.000.

Thomas & Betts Corporation: *See*—
Dienes, Zoltan B., 4,691,083, Cl. 174-135.000.

Thomas, Glenn M.: *See*—
Emler, Don R.; and Thomas, Glenn M., 4,690,107, Cl. 123-65.00V.

Thomas, William R., to Thoren Caging Systems, Inc. Ventilated animal housing and service system with cage filter covers. 4,690,100, Cl. 119-15.000.

Thompson, William L.: *See*—
Sterling, Edward L., Jr.; and Thompson, William L., 4,691,328, Cl. 375-36.000.

Thomson-CSF: *See*—
Eumurian, Gregoire; and Courty, Albert, 4,691,386, Cl. 455-607.000.

Thoren Caging Systems, Inc.: *See*—
Thomas, William R., 4,690,100, Cl. 119-15.000.

Thorp, Bruce E.: *See*—
Forbes, Richard L., II; and Thorp, Bruce E., 4,690,544, Cl. 355-15.000.

Thrower, Eugene S.: *See*—
Baker, Harold R.; Thrower, Eugene S.; and Simpson, David C., 4,690,779, Cl. 252-546.000.

Thurmond, Gary D.: *See*—
Gee, Caroline M.; and Thurmond, Gary D., 4,690,488, Cl. 350-96.120.

Tidy Chain Pty. Ltd.: *See*—
Mitchell, Francoise E. L., 4,690,288, Cl. 211-113.000.

Tihanyi, Jenoe: *See*—
Einzinger, Josef; Fellinger, Christine; Leipold, Ludwig; Tihanyi, Jenoe; and Weber, Roland, 4,691,129, Cl. 307-581.000.

Till, Andrew: *See*—
Radvan, Bronislaw; and Till, Andrew, 4,690,860, Cl. 428-290.000.

Till, Henry R.: *See*—
Radulski, Charles A.; and Till, Henry R., 4,690,539, Cl. 355-3.0TR.

Timineri, Anthony A., to Nissho Iwai American Corporation. Antenna positioning apparatus. 4,691,207, Cl. 343-766.000.

Tiomkin, Michael: *See*—
Bar-Nefy, Simcha; and Tiomkin, Michael, 4,690,030, Cl. 89-1.130.

Titus, George R.: *See*—
Davis, Ronald I.; Phalangas, Charalambos J.; and Titus, George R., 4,690,817, Cl. 424-70.000.

TMC Corporation: *See*—
Spitaler, Englebert; and Wuerthner, Hubert, 4,690,424, Cl. 280-633.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Nakamura, Teiji; Nishikawa, Eiichiro; and Koyama, Takeo, 4,691,070, Cl. 585-273.000.

Tobin, Thomas J.: *See*—
Chabala, Leonard V.; Haarsma, John; O'Leary, Raymond P.; Roman, Christopher D.; and Tobin, Thomas J., 4,690,780, Cl. 252-572.000.

Tochigifujisangyo Kabushikigaisha: *See*—
Teraoka, Masao; and Yuhashi, Yukio, 4,690,258, Cl. 192-58.00C.

Tock, Richard W.: *See*—
Ethington, Don; Riley, Ray J.; and Tock, Richard W., 4,690,743, Cl. 204-168.000.

Toda, Takezi: *See*—
Yamaguchi, Yoshimitsu; Shibata, Tadahiko; Suzuki, Masanori; and Toda, Takezi, 4,690,349, Cl. 242-75.500.

Tohara, Tsutomu: *See*—
Yamauchi, Fumio; Tohara, Tsutomu; Nakano, Shigeo; and Emoto, Shigeo, 4,690,960, Cl. 523-442.000.

Tojo, Kakuji: *See*—
Chien, Yie W.; and Tojo, Kakuji, 4,690,683, Cl. 604-896.000.

Tokai Carbon Co., Ltd.: *See*—
Kida, Tohru; and Yamamoto, Motohiro, 4,690,811, Cl. 423-345.000.

Tokai Corporation: *See*—
Nitta, Tomio, 4,690,377, Cl. 251-354.000.

Toki, Masahisa; Satoh, Seiji; Matsui, Yoshiaki; Morihata, Kunio; and Murata, Toyoji, to Mitsubishi Rayon Company Ltd. Flat yarn and method for producing the same. 4,689,944, Cl. 57-260.000.

Tokico Ltd.: *See*—
Ando, Hiromi; Endo, Mitsuhiro; and Ono, Yukou, 4,690,034, Cl. 91-369.00A.

Tokiko, Ltd.: *See*—
Nishimura, Makoto, 4,691,153, Cl. 318-696.000.

Toko, Inc.: *See*—
Kondo, Hiroshi, 4,691,120, Cl. 307-265.000.

Tokoro, Setsuo: *See*—
Obayashi, Hideki; Kawai, Hisai; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.

Tokudome, Yoshihiro: *See*—
Fukuma, Nobuo; Hasegawa, Hisayasu; Murayama, Kimimasa; Hayashi, Kunio; and Tokudome, Yoshihiro, 4,689,864, Cl. 29-157.10R.

Tokyo Electric Co., Ltd.: *See*—
Uchimura, Mitsuo; and Masuyama, Tsutomu, 4,690,230, Cl. 177-229.000.

Tokyo Juki Industrial Co., Ltd.: *See*—
Satoma, Shiro, 4,690,079, Cl. 112-162.000.
Taguchi, Katsuhiko, 4,691,257, Cl. 360-97.000.

Tokyo Keiki Co., Ltd.: *See*—
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,690,156, Cl. 128-804.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ueshin, Akito, 4,690,268, Cl. 198-399.000.

Tolliver, Wilbur E. Concrete reinforcement spacer and method of use. 4,689,867, Cl. 29-453.000.

Tomalia, Donald A.; and Hall, Mark J., to Dow Chemical Company, The. Star/comb-branched polyamine. 4,690,985, Cl. 525-419.000.

Tomibe, Shinji; Gomibuchi, Reizo; Takahashi, Kiyofumi; and Kato, Noboru, to Nihon Sanmo Dyeing Co., Ltd. Electrically conducting material and method of preparing same. 4,690,854, Cl. 428-195.000.

Tomita, Koji: *See*—
Saitoh, Kyoichiro; Konishi, Masataka; and Tomita, Koji, 4,690,926, Cl. 514-269.000.

Tomita, Yasuo: *See*—
Iwasaki, Takashi; Tomita, Yasuo; and Hayashi, Tsunekazu, 4,690,839, Cl. 427-366.000.

Tomkiewicz, Yaffa: *See*—
Clarke, Thomas C.; Lu, Neng H.; Tomkiewicz, Yaffa; and Tong, Ho M., 4,690,836, Cl. 427-299.000.

Tomohisa, Kunio; Maeda, Kiyoshi; and Cho, Masamichi, to Dainippon Screen Mfg. Co., Ltd. Method and system for compensating for a shading phenomenon. 4,691,241, Cl. 358-293.000.

Tong, Ho M.: *See*—
Clarke, Thomas C.; Lu, Neng H.; Tomkiewicz, Yaffa; and Tong, Ho M., 4,690,836, Cl. 427-299.000.

Toray Industries, Inc.: *See*—
Takezawa, Yoshio; and Akatsu, Tatsuo, 4,690,969, Cl. 524-413.000.

Tormaschy, Williard R.: *See*—
Bleth, Joel J.; and Tormaschy, Williard R., 4,690,179, Cl. 141-1.000.

Tosa, Takafumi; Koga, Yoshihiro; and Matsuishi, Tsutomu, to Ajinomoto Co., Inc. Method for separating a basic amino acid. 4,691,054, Cl. 562-554.000.

Tosaka, Yoichi: *See*—
Kawamura, Masaharu; Harada, Yoshihito; Kobayashi, Ryuichi; Suzuki, Masayuki; Ohara, Tsunemasa; and Tosaka, Yoichi, 4,690,532, Cl. 354-173.110.

Tourisme Hotellerie Ltd.: *See*—
Sauer, Claude; Burger, Raymond; Reguigne, Gabriel; and Kern, Mark, 4,690,874, Cl. 428-537.100.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Fukuda, Mitsutoshi; Fukutomi, Makoto; Kogure, Osamu; and Miyoshi, Kazunori, 4,690,887, Cl. 430-331.000.
Koyama, Kenji; and Ohno, Shotaro, 4,690,754, Cl. 210-94.000.
Tsukuma, Koji; and Tsukidate, Takaaki, 4,690,910, Cl. 501-103.000.

Toyohara, Tsutomu: *See*—
Sasano, Ryoichiro; Toyohara, Tsutomu; and Takigawa, Toshimichi, 4,690,020, Cl. 82-2.00D.

Toyoshima, Satoshi: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Iio, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Asami, Ken; Onuma, Toshio; Ohashi, Kaoru; and Buma, Shuuichi, 4,690,429, Cl. 280-707.000.
Buma, Shuuichi, 4,690,430, Cl. 280-708.000.
Chiba, Yoshinori; Ishida, Keiichi; and Sugiura, Fumio, 4,690,456, Cl. 297-284.000.
Fujisawa, Naoki, 4,690,448, Cl. 296-37.800.
Fukuma, Nobuo; Hasegawa, Hisayasu; Murayama, Kimimasa; Hayashi, Kunio; and Tokudome, Yoshihiro, 4,689,864, Cl. 29-157.10R.

Fukuta, Kenji; Kaneko, Takaoki; and Takahashi, Yoshinobu, 4,690,097, Cl. 118-723.000.
Isobe, Toshiaki; and Oba, Hidehiro, 4,690,117, Cl. 123-492.000.
Izumi, Toshio; Saito, Ryozo; Kato, Yoichi; and Miyata, Hiroshi, 4,691,284, Cl. 364-424.000.
Kanda, Mutsumi, 4,690,105, Cl. 123-41.82R.
Miyadera, Kazuhiko, 4,690,241, Cl. 180-315.000.
Nagano, Shuji; Ida, Shuichiro; Yoshinaka, Toshio; and Okuda, Shozo, 4,690,015, Cl. 74-665.0GE.
Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; Tokoro, Setsuo; and Kohama, Tokio, 4,691,286, Cl. 364-431.040.
Sogabe, Ichita; Murata, Syuuji; and Yokoya, Yuji, 4,691,135, Cl. 310-254.000.
Sumiya, Koji; Watanabe, Kazuaki; and Kubo, Seitoku, 4,690,037, Cl. 92-130.00R.
Takahashi, Tokuyuki; Kuramochi, Koujiro; and Sayou, Syoichi, 4,690,239, Cl. 180-249.000.
Taniguchi, Hiroji; Iwatsuki, Kunihiro; and Shindou, Yoshio, 4,690,017, Cl. 74-866.000.
Uchida, Goro, 4,690,039, Cl. 98-2.080.
Umemoto, Yonetsugu; Shirasawa, Hiroshi; Ogo, Muneya; Kinoshita, Kazumasa; and Kondo, Tetsuo, 4,690,581, Cl. 403-133.000.
Uranishi, Kouji; and Itoh, Takaaki, 4,690,293, Cl. 220-86.00R.
Yasukawa, Masao, 4,690,104, Cl. 123-41.320.

Trage, Burkhard; and Leitz, Richard, to Balcke-Durr Aktiengesellschaft. Natural-draft cooling tower with forced-draft flow over reflux condensers. 4,690,207, Cl. 165-113.000.

Trainor, Diane A.: *See*—
Dutta, Anand S.; Stein, Ross L.; Trainor, Diane A.; and Wildonger, Richard A., 4,691,007, Cl. 530-331.000.

Trans-Guard Industries, Inc.: *See*—
Brammall, Terrence N., 4,690,443, Cl. 292-307.00R.

Treficable Pirelli: *See*—
Sebille, Michel, 4,690,627, Cl. 425-113.000.

Tri/Mark Corporation: *See*—
Larsen, Marvin L., 4,689,976, Cl. 70-208.000.

Trischler, Ferenc: *See*—
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

Triton Aquatherm Limited: *See*—
Dalton, Martin W., 4,690,334, Cl. 239-452.000.

Trostanovsky, Boris A.: *See*—
Vernikov, Arkady Y.; Gamarnik, Iosif I.; Rashkovich, Mikhail P.; Trostanovsky, Boris A.; and Khinkus, Alexandr S., 4,691,183, Cl. 335-289.000.

Trussler, Geoffrey A.: *See*—
Beckley, Keith A.; Jacob, Neil R.; and Trussler, Geoffrey A., 4,689,991, Cl. 73-304.00C.

Tsai, John (Ji-Hsiung): *See*—
Shih, Yen-Jer; Tsai, John (Ji-Hsiung); Chiao, Wen B.; and Ray-Chaudhuri, Dilip K., 4,690,996, Cl. 527-312.000.

Tsai, Tsang J.: *See*—
Tsai, Tzong D.; and Tsai, Tsang J., 4,690,170, Cl. 137-624.110.

Tsai, Tzong D.; and Tsai, Tsang J. Safety gas valve with timer. 4,690,170, Cl. 137-624.110.

Tsang, Chi-Hwa; Kawamoto, Galen; and Yau, Leopoldo D., to Intel Corporation. Pattern delineation of vertical load resistor. 4,690,728, Cl. 156-643.000.

TSCO Corporation: *See*—
Walls, Henry M.; and Sayers, George M., Jr., 4,690,095, Cl. 116-67.00R.

Tsubuko, Kazuo: *See*—
Nagai, Kayoko; and Tsubuko, Kazuo, 4,690,881, Cl. 430-114.000.

Tsuchiya, Fumio: *See*—
Fukuda, Minoru; Takahashi, Hideaki; Sugiura, June; Tsuchiya, Fumio; and Kihara, Toshimasa, 4,691,298, Cl. 365-189.000.

Tsuchiya, Hiroyuki: *See*—
Kato, Kinya; and Tsuchiya, Hiroyuki, 4,690,565, Cl. 356-446.000.

Tsuchiya, Masahiro, to Clarion Co., Ltd. Spread-spectrum communication system. 4,691,326, Cl. 375-1.000.

Tsuji, Nobuo: *See*—
Okita, Tsutomu; Tsuji, Nobuo; Hashimoto, Hiroshi; and Mukaida, Yoshito, 4,690,870, Cl. 428-425.900.

Tsuji, Seiichi: *See*—
Sakamoto, Toshinori; Hirashima, Isao; and Tsuji, Seiichi, 4,690,432, Cl. 280-775.000.

Tsujimura, Masakuni: *See*—
Sasakura, Hachirou; and Tsujimura, Masakuni, 4,690,122, Cl. 123-609.000.

Tsukidate, Takaaki: *See*—
Tsukuma, Koji; and Tsukidate, Takaaki, 4,690,910, Cl. 501-103.000.

Tsukuma, Koji; and Tsukidate, Takaaki, to Toyo Soda Manufacturing Co., Ltd. Sintered product of zirconia and method of producing the same. 4,690,910, Cl. 501-103.000.

Tsuno, Nobuo: *See*—
Oda, Isao; and Tsuno, Nobuo, 4,690,617, Cl. 416-241.00B.

Tsunoyama, Kouzou; Ohashi, Yoshiharu; Furunushi, Yasuko; and Konishi, Motoyuki, to Kawasaki Steel Corporation. Method of laser emission spectroscopical analysis and apparatus therefor. 4,690,558, Cl. 356-318.000.

Tsurumaru, Shinobu: *See*—
Kanno, Masayoshi; Hideshima, Yasuhiro; Tsurumaru, Shinobu; and Kanayama, Ikuo, 4,691,236, Cl. 358-181.000.

Tsuyuguchi, Hiroshi: *See*—
Sakai, Yoshiaki; and Tsuyuguchi, Hiroshi, 4,691,255, Cl. 360-69.000.

Tucel Industries, Inc.: *See*—
Lewis, John C., Jr., 4,690,277, Cl. 206-362.100.

Tuckley, Trevor R.; and Pike, Harold W. E. Strip structure intended for clamping on a flange. 4,690,412, Cl. 277-184.000.

Tuckman, Drew E. Brush extension device. 4,690,579, Cl. 401-127.000.

Tupitsyn, Konstantin K.; Tupitsyn, Sergei K.; Kostylev, Alexandr D.; Kamensky, Veniamin V.; and Chufistov, Sergei A., to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR. Percussive tool. 4,690,225, Cl. 173-116.000.

Tupitsyn, Sergei K.: *See*—
Tupitsyn, Konstantin K.; Tupitsyn, Sergei K.; Kostylev, Alexandr D.; Kamensky, Veniamin V.; and Chufistov, Sergei A., 4,690,225, Cl. 173-116.000.

Tupman, David J., to Caterpillar Industrial Inc. Optical communication apparatus for a vehicle. 4,691,385, Cl. 455-607.000.

Turbe, Jean Pierre, to Societe Nationale des Chemins de Fer Francais. Method and apparatus for the non-destructive testing of railroad track rails. 4,689,995, Cl. 73-636.000.

Tuttle, William E. Cleat and device therefor. 4,690,090, Cl. 114-218.000.

UBE Industries, Inc.: *See*—
Dannoura, Sadayuki, 4,690,197, Cl. 164-312.000.
Ito, Bunsaku; Fukuda, Kimio; and Hara, Rikio, 4,690,856, Cl. 428-215.000.

Ube Industries, Ltd.: *See*—
Makino, Hiroshi; and Nakatani, Masayuki, 4,690,873, Cl. 428-473.500.

Uchida, Goro, to Toyota Jidosha Kabushiki Kaisha. Air conditioner for vehicle. 4,690,039, Cl. 98-2.080.

Uchida, Satoshi: *See*—
Kashiwazaki, Masamichi; Ogawa, Kiichiro; and Uchida, Satoshi, 4,689,949, Cl. 60-39.120.

Uchida, Teruyoshi: *See*—
Ooe, Akihiko; Imaiida, Tetsuo; Uchida, Teruyoshi; and Kojima, Hirotaka, 4,690,147, Cl. 128-635.000.

Uchikawa, Naoshi: *See*—
Murayama, Akira; Kuno, Hiroaki; Uchikawa, Naoshi; Tamura, Takahiro; Mizuno, Takao; Aiba, Kazumi; Ikeda, Mitsuo; and Fukatsu, Kiyoshi, 4,690,625, Cl. 418-55.000.

Uchimura, Mitsuo; and Masuyama, Tsutomu, to Tokyo Electric Co., Ltd. Multi-range load cell weighing instrument. 4,690,230, Cl. 177-229.000.

Uchiyama, Yuki, to Sakai & Co., Ltd. Cassette tape holder. 4,690,278, Cl. 206-387.000.

Ueba, Hisaaki: *See*—
Fukuda, Ken; and Ueba, Hisaaki, 4,690,849, Cl. 428-91.000.

Ueda, Hiroyuki; and Kobata, Yoshihiro, to Canon Kabushiki Kaisha. Device for controlling printing pressure according to the kind of ink ribbon being used. 4,690,575, Cl. 400-166.000.

Ueda, Yoshio: *See*—
Uemura, Toshinobu; Okhuma, Toshiaki; Shinooka, Kiyohide; Ishikuro, Hiroshi; and Ueda, Yoshio, 4,690,822, Cl. 424-455.000.

Uemura, Michihiko: *See*—
Okada, Takeshi; Hashimoto, Haruto; and Uemura, Michihiko, 4,691,178, Cl. 333-143.000.

Uemura, Toshinobu; Okhuma, Toshiaki; Shinooka, Kiyohide; Ishikuro, Hiroshi; and Ueda, Yoshio, to Fujisawa Pharmaceutical Co., Ltd. Novel drug carrier and pharmaceutical preparation comprising the same. 4,690,822, Cl. 424-455.000.

Ueno, Tatsuaki; and Inoue, Hajime, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Semiconductor integrated circuit device. 4,691,217, Cl. 357-23.130.

Uerdingen, Walter: *See*—
Wahle, Bernd; Freitag, Dieter; Uerdingen, Walter; Heine, Heinrich; and Blazejak, Manfred, 4,690,998, Cl. 528-96.000.

Ueshin, Akito, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet convey apparatus. 4,690,268, Cl. 198-399.000.

Uhmann, Rainer; and Radscheit, Kurt, to Hoechst Aktiengesellschaft. Process for the low-racemization preparation of peptide intermediates of the synthesis of gonadorelin and gonadorelin analogs, and new intermediates for this process. 4,691,008, Cl. 530-339.000.

Ujii, Yasuo: *See*—
Kubota, Takao; and Ujii, Yasuo, 4,690,535, Cl. 354-322.000.

Uken, William D.; Dubrow, Robert S.; Nelson, Carib; and Dittmer, Catherine A., to Raychem Corp. Protective article. 4,690,831, Cl. 427-44.000.

Ukisu, Hiroshi, to Epoch Company, Ltd. Interactive educational device. 4,690,645, Cl. 434-309.000.

Ullman, Johan. Improvements in working chair. 4,690,459, Cl. 297-458.000.

Umemoto, Yonetsugu; Shirasawa, Hiroshi; Ogo, Muneya; Kinoshita, Kazumasa; and Kondo, Tetsuo, to Toyota Jidosha Kabushiki Kaisha; and Odai Tekko Kabushiki Kaisha. Ball joint. 4,690,581, Cl. 403-133.000.

Umiker, Hans, to Alexander Schoeller & Co. AG. Method for sorting out certain containers, such as industrial containers, bottle crates etc. from a stock of containers and a device on a container for the identification of a to be sorted out container. 4,690,751, Cl. 209-3.300.

Union Camp Corporation: *See*—
Johnson, Robert W., Jr., 4,690,783, Cl. 260-104.000.
Veazey, Richard L., 4,690,979, Cl. 525-153.000.
Veazey, Richard L.; and Hayes, Kathryn S., 4,690,982, Cl. 525-331.900.

Veazey, Richard L.; and Hayes, Kathryn S., 4,690,983, Cl. 525-331.900.
Veazey, Richard L.; and Pavlin, Mark S., 4,690,984, Cl. 525-332.300.

Union Carbide Corporation: *See—*
Ananthapadmanabhan, Kavssery P.; and Goodard, Errol D., 4,690,892, Cl. 435-183.000.
Breneman, William C.; and Reeser, David M., 4,690,810, Cl. 423-335.000.
Doshi, Kishore J., 4,690,695, Cl. 55-16.000.
Forte, Paulino; and Vidueira, Jose A., 4,690,733, Cl. 203-21.000.
Kilgour, John A.; and Jorgenson, Michael W., 4,690,955, Cl. 521-112.000.
Pohl, Eric R.; and Pepe, Enrico J., 4,691,038, Cl. 556-407.000.
Wilson, Stephen T.; Woodard, Naomi A.; and Flanigen, Edith M., 4,690,808, Cl. 423-305.000.

Unisys Corporation: *See—*
Danilenko, Michael; Rusterholz, John T.; and Lahti, Archie E., 4,691,279, Cl. 364-200.000.

United Merchants & Manufacturers Inc.: *See—*
Porter, Rick A.; and Hoernle, Hans R., 4,690,859, Cl. 428-251.000.

United States of America
Agriculture: *See—*
Wehr, Michael A.; and Sajdak, Robert L., 4,690,309, Cl. 222-249.000.
Air force: *See—*
Kuck, John H., 4,691,305, Cl. 367-3.000.
Army: *See—*
Bernazzani, Richard J.; and Bumbaca, Domenic J., 4,689,886, Cl. 30-416.000.
Bovino, Lawrence J., 4,691,111, Cl. 250-551.000.
Mon, George, 4,691,187, Cl. 338-114.000.
Stern, Richard A.; and Babbitt, Richard W., 4,691,208, Cl. 343-785.000.
Energy: *See—*
Murphy, Lawrence M., 4,691,075, Cl. 136-246.000.
Health and Human Services: *See—*
Lyddy, James E., Jr.; Penland, William Z.; and Sugarbaker, Paul H., 4,690,131, Cl. 128-4.000.
Rosenberg, Steven A., 4,690,915, Cl. 514-2.000.
National Aeronautics and Space Administration: *See—*
Haslim, Leonard A.; and Lee, Robert D., 4,690,353, Cl. 244-134.00D.
Navy: *See—*
Chamberland, Roger R.; and Stanland, Andrew J., 4,690,482, Cl. 439-578.000.
Kershaw, Joseph E., 4,691,209, Cl. 343-846.000.

U.S. Philips Corporation: *See—*
Appels, Johannes A.; and Maas, Henricus G. R., 4,689,872, Cl. 437-228.000.
Arragon, Jean-Pierre; and Michel, Jean-Pierre, 4,691,352, Cl. 380-14.000.
Bertram, Leo; and Schemmann, Hugo, 4,691,132, Cl. 310-156.000.
Bollard, David R., 4,691,381, Cl. 455-334.000.
Boudewijns, Arnoldus J. J., 4,691,218, Cl. 357-24.000.
Dijkstra, Arend; Haijkens, Bernardus; and Veenstra, Mient, 4,691,134, Cl. 310-234.000.
Dohmen, Petrus J. M., 4,691,142, Cl. 313-623.000.
Gerritsen, Jan; and Mensies, Otto, 4,691,139, Cl. 313-413.000.
Hoeberechts, Arthur M. E., 4,691,191, Cl. 340-347.00P.
Huizer, Cornelis M., 4,691,127, Cl. 307-475.000.
Jansen, Gerardus L. M.; Smulders, Henricus J.; and Schuitmaker, Pieter D., 4,691,311, Cl. 369-100.000.
Janssen, Petrus J.; and Janssens, Peter C., 4,690,503, Cl. 350-96.300.
Khoe, Giok D., 4,690,493, Cl. 350-96.200.
Le Poole, Jan B.; and Dekkers, Nicolaas H., 4,691,103, Cl. 250-311.000.
Lue, Hsueh C., 4,690,274, Cl. 206-328.000.
Neyer, Antonius A., 4,690,489, Cl. 350-96.140.
Suzuki, Yukio, 4,691,309, Cl. 369-38.000.
Van Roermund, Arthur H. M.; and Coppelmans, Petrus M. C., 4,691,171, Cl. 328-167.000.
Van Uijen, Cornelis M. J., 4,691,162, Cl. 324-309.000.
Wolfstieg, Ulrich M. E. A., 4,691,334, Cl. 378-71.000.

United Technologies Automotive, Inc.: *See—*
Lorenz, Jerome L., 4,689,882, Cl. 30-90.100.
Rahrig, Thomas F.; and Hall, Thomas E., 4,690,478, Cl. 439-271.000.

United Technologies Corporation: *See—*
Banas, Conrad M.; and Doyle, Brian M., 4,691,093, Cl. 219-121.0LC.
Kay, Ira W.; and Lehrach, Ronald P. C., 4,691,288, Cl. 364-511.000.
Kish, Jules G., 4,690,390, Cl. 267-155.000.
Madden, William M., 4,690,329, Cl. 239-265.190.
Murphy, Richard D.; and Fischer, William C., 4,691,315, Cl. 371-9.000.
Robinson, Ronald L.; and Honeycutt, Fred L., Jr., 4,690,330, Cl. 239-265.390.

Universities Space Research Association: *See—*
Van Alstine, James M.; Harris, J. Milton; Shafer, Steve; Snyder, Robert S.; and Herren, Blair, 4,690,749, Cl. 204-299.00R.

University of Dayton: *See—*
Minardi, John E.; and von Ohain, Hans P., 4,689,950, Cl. 60-204.000.

University of Florida: *See—*
Laitinen, Herbert A.; and Hoshino, Shigeo, 4,690,735, Cl. 204-37.100.

University of Miami: *See—*
Ryan, James W., 4,690,936, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,690,937, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,690,938, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,690,939, Cl. 514-362.000.
Ryan, James W.; and Chung, Alfred, 4,690,940, Cl. 514-362.000.

University of Michigan, The: *See—*
Carson, Paul L.; and Detsch, Richard M., 4,689,986, Cl. 73-19.000.

University of North Carolina at Chapel Hill, The: *See—*
Giammara, Beverly L.; and Hanker, Jacob S., 4,690,901, Cl. 436-86.000.

UOP Inc.: *See—*
Bricker, Jeffery C., 4,691,071, Cl. 585-319.000.
Engel, Dusan J.; and Gilson, Jean-Pierre, 4,691,063, Cl. 568-783.000.

Uponor N.V.: *See—*
Jarvenkyla , Jyri, 4,690,174, Cl. 138-121.000.

Urani, Angelo, to Cooper Industries, Inc. Cartridge fuse holder. 4,690,648, Cl. 439-622.000.

Uranishi, Kouji; and Itoh, Takaaki, to Toyota Jidosha Kabushiki Kaisha. Filler cap structure for a fuel tank. 4,690,293, Cl. 220-86.00R.

Urata, Toshimitsu, to Kensa Giken Co., Ltd. Jig for carrying out movement and alignment within a pipe. 4,690,006, Cl. 73-866.500.

Urbach, Hansjorg: *See—*
Henning, Rainer; and Urbach, Hansjorg, 4,691,022, Cl. 548-408.000.

Urbas, Branko, to CPC International Inc. Concentration of organic chemicals from dilute aqueous solutions. 4,691,055, Cl. 562-589.000.

Urbutis, Algimantas P., to Viskase Corporation. Shirred casing article. 4,690,173, Cl. 138-118.100.

USG Industries, Inc.: *See—*
Green, William J.; and Semmerling, Ralph P., 4,689,927, Cl. 52-180.000.

Usui, Takayuki, to Mitsui & Co., Ltd. Method of preventing retrogradation of foodstuffs. 4,690,829, Cl. 426-661.000.

Utsumi, Atsushi: *See—*
Hayami, Hiroyuki; and Utsumi, Atsushi, 4,690,500, Cl. 350-96.250.

Utsunomiya, Shunji; Teramoto, Tsutomu; and Huruta, Tadashi, to Omron Tateisi Electronics Co. Blood pressure measuring apparatus. 4,690,151, Cl. 128-682.000.

v.d. Vlekkert, Hendrik H.; and de Rooy, Nicolaas F., to Sentron v.o.f. Apparatus for determining the activity of an ion (pIon) in a liquid. 4,691,167, Cl. 324-438.000.

V. W. Kaiser Engineering, Inc.: *See—*
Smith, Joseph E., 4,690,418, Cl. 280-96.100.

Vacca, Joseph P.: *See—*
Huff, Joel R.; Vacca, Joseph P.; and Baldwin, John J., 4,690,928, Cl. 514-285.000.

Vadakin, Inc.: *See—*
Vadakin, Thomas C.; and Hoenigman, Thomas A., 4,690,159, Cl. 134-167.00C.

Vadakin, Thomas C.; and Hoenigman, Thomas A., to Vadakin, Inc. Rotary cleaning device. 4,690,159, Cl. 134-167.00C.

Vaghani, Vallabh V.: *See—*
Hayden, Howard L.; Vaghani, Vallabh V.; and Readman, John, 4,690,470, Cl. 439-13.000.

Valenyi, Louis J.; Pesa, Frederick A.; and Paparizos, Christos, to Standard Oil Company, The. Production of synthesis gas. 4,690,777, Cl. 252-373.000.

Valeo: *See—*
Billet, Rene , 4,689,954, Cl. 60-338.000.
Loup, Didier, 4,690,366, Cl. 248-676.000.
Marchisio, Aldo; and Beccaris, Carlo, 4,690,659, Cl. 464-68.000.
Naudin, Jacky, 4,690,259, Cl. 192-70.280.

Vallejo, Alfonso P.: *See—*
Arechaga, Sabastian J.; Granell, Jose O. O.; Linan, Carmen S.; Vallejo, Alfonso P.; and Gabarro, Jose A. P., 4,690,945, Cl. 514-448.000.

Valliere, Yves: *See—*
Granier, Georges; and Valliere, Yves, 4,690,063, Cl. 102-530.000.

Vanacore, Vincent D., to American Telephone and Telegraph Company; and AT&T Information System Inc. PBX integrity arrangement for maintaining the functional integrity of PBX communication devices and associated facilities. 4,691,346, Cl. 379-198.000.

Van Alstine, James M.; Harris, J. Milton; Shafer, Steve; Snyder, Robert S.; and Herren, Blair, to Universities Space Research Association. Polymer-coated surfaces to control surface zeta potential. 4,690,749, Cl. 204-299.00R.

Van Daalen, Peter A.: *See—*
Laugs, Johannis A. B.; Van Den Berg, Gerrit; Van Daalen, Peter A.; and Reinders, Edward D., 4,690,718, Cl. 156-48.000.

Vandegriff, Hugh R.: *See—*
Elco, Richard A.; and Vandegriff, Hugh R., 4,690,472, Cl. 439-67.000.

Van Den Berg, Gerrit: *See—*
Laugs, Johannis A. B.; Van Den Berg, Gerrit; Van Daalen, Peter A.; and Reinders, Edward D., 4,690,718, Cl. 156-48.000.

van der Laan, Johan S.: *See—*
McAlevey, Richard J.; Muir, Malcolm D.; and van der Laan, Johan S., 4,691,345, Cl. 379-158.000.

Vanderpool, Clarence D.: *See—*
Scheithauer, Richard A.; Vanderpool, Clarence D.; Miller, Michael J.; and Gingerich, Richard G. W., 4,690,710, Cl. 75-0.5AA.

Van Erden, Donald L., to Minigrip, Inc. Manufacture of multi-layered reclosable bag making material and bags made therefrom. 4,691,372, Cl. 383-63.000.

Vangelov, Ivan V.: *See—*
Garlanov, Dimo T.; Dimitrov, Dimieter A.; Beleov, Marin H.; Hlbearov, Vladimir P.; Vangelov, Ivan V.; Nikov, Nikolay Y.; and Savov, Ivan S., 4,691,090, Cl. 219-121.0PC.

van Os, Willem A. A. A., to Akzo N.V. Assembly of intra-uterine contraceptive device and insertor. 4,690,136, Cl. 128-130.000.

VanRens, Russell J., to Outboard Marine Corporation. Lost foam mold pattern and associated method. 4,690,201, Cl. 164-516.000.

Van Roermund, Arthur H. M.; and Coppelmans, Petrus M. C., to U.S. Philips Corporation. Integrated RC filter with resistor trimming. 4,691,171, Cl. 328-167.000.

Van Ry, Charles D. Apparatus for microaquaculture and pollution control. 4,690,756, Cl. 210-221.200.

Van Steenburgh, Leon R., Jr., to Wilkerson Corporation. Refrigerated gas separation apparatus. 4,689,969, Cl. 62-474.000.

Van Uijen, Cornelis M. J., to U.S. Philips Corporation. Method and device for NMR spectroscopy. 4,691,162, Cl. 324-309.000.

Van Winkle, Denzal W. Self actuating locking and unlocking arrangement and method for reciprocating piston type actuators. 4,690,033, Cl. 91-43.000.

Van Winkle, Denzal W. Bonded mechanically inner connected seal arrangement for a blowout preventer. 4,690,411, Cl. 277-166.000.

Vartan, Henri. Collapsible laundry press. 4,689,905, Cl. 38-26.000.

Vayman, Zinovy Y.: *See—*
Gregory, James A.; Hanoka, Jack I.; and Vayman, Zinovy Y., 4,691,077, Cl. 136-256.000.

Veazey, Richard L., to Union Camp Corporation. Terminally functionalized poly(alloocimene). 4,690,979, Cl. 525-153.000.

Veazey, Richard L.; and Hayes, Kathryn S., to Union Camp Corporation. Epoxidized poly(alloocimene). 4,690,982, Cl. 525-331.900.

Veazey, Richard L.; and Hayes, Kathryn S., to Union Camp Corporation. Hydrogenated poly(alloocimene). 4,690,983, Cl. 525-331.900.

Veazey, Richard L.; and Pavlin, Mark S., to Union Camp Corporation. Metal complexes of poly(alloocimene). 4,690,984, Cl. 525-332.300.

Veb Kombinat Polygraph "Werner Lamberz" Leipzig: *See—*
Morgenstern, Bernd; Weigend, Helmut; and Reinhardt, Peter, 4,690,564, Cl. 356-445.000.

Veenhuizen, Edward L.: *See—*
Anderson, David B.; Schmiegel, Klaus K.; and Veenhuizen, Edward L., 4,690,951, Cl. 514-653.000.

Veenstra, Mient: *See—*
Dijkstra, Arend; Haijkens, Bernardus; and Veenstra, Mient, 4,691,134, Cl. 310-234.000.

Vehashkaya, Amida Sinun: *See—*
Orlans, Itzhak, 4,690,761, Cl. 210-330.000.

Veitch, Randall C., to Qualtronics Corporation. Thermal profile system. 4,690,569, Cl. 374-11.000.

Velenyi, Louis J.; and Krupa, Andrew S., to Standard Oil Company, The. Process for the production of hydrogen. 4,690,814, Cl. 423-648.00R.

Veltman, Preston L.: *See—*
Tell, Elaine N.; and Veltman, Preston L., 4,690,772, Cl. 252-106.000.

Veltrup, Elmar M. Apparatus for removing solid structures from body passages. 4,690,672, Cl. 604-43.000.

Venuti, Michael C.: *See—*
Fried, John H.; and Venuti, Michael C., 4,690,925, Cl. 514-267.000.

Verburgh, Martin B.; and Pfeifle, Dieter, to SKF Industrial Trading and Development Company B.V. Method for welding two parts together employing a concentrated energy beam and protective member. 4,691,092, Cl. 219-121.0LD.

Verkler, Charles E., to International Food Equipment Inc. Hamburger cooking apparatus. 4,690,044, Cl. 99-419.000.

Vernay, Pierre, to Foseco International Limited. Casting of molten ferrous metal and moulds for use therein. 4,690,196, Cl. 164-58.100.

Vernikov, Arkady Y.; Gamarnik, Iosif I.; Rashkovich, Mikhail P.; Trostanovsky, Boris A.; and Khinkus, Alexandr S., to Odesskoe Spetsialnoe Konstruktorskoe Bjuro Spetsialnykh Stankov. Device for magnetically holding workpieces. 4,691,183, Cl. 335-289.000.

Versace, Richard W.: *See—*
Ganguly, Ashit K.; Girijavallabhan, Viyyoor M.; Pinto, Patrick A.; and Versace, Richard W., 4,690,922, Cl. 514-210.000.

VerWeire, James R.: *See—*
Armer, Leon N., Jr.; Antonio, Joseph M.; Roth, Craig A.; and VerWeire, James R., 4,690,061, Cl. 102-401.000.

Vickery, Brian: *See—*
Nestor, John J., Jr.; and Vickery, Brian, 4,690,916, Cl. 514-15.000.

Victor Company of Japan: *See—*
Nishimoto, Naomichi, 4,691,248, Cl. 358-320.000.

Victor Company of Japan, Ltd.: *See—*
Kashiwagi, Shigeru, 4,691,147, Cl. 315-371.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; and Kuriyama, Takashi, 4,691,227, Cl. 358-47.000.

Vidal, Jean; Malaubier, Francois; and Mevel, Jean-Claude, to Stein Industrie. Ignition and combustion supporting burner for pulverized solid fossil fuel and combustion chamber comprising same. 4,690,075, Cl. 110-264.000.

Vidueira, Jose A.: *See—*
Forte, Paulino; and Vidueira, Jose A., 4,690,733, Cl. 203-21.000.

Viereck, Hans: *See—*
Hamilton, Douglas D.; Palfy, Robert M.; and Viereck, Hans, 4,690,185, Cl. 144-34.00R.

Vieth, Friedhelm: *See—*
Klose, Sigmar; Pasch, Manfred; Schlumberger, Helmut; Kleemann, Wolfgang; and Vieth, Friedhelm, 4,690,899, Cl. 436-45.000.

Vikar nee Petho , Hajnalka: *See—*
Ezer, Elemer; Harsanyi, Kalman; Vikar nee Petho , Hajnalka; Matuz, Judit; Szporny, Laszlo ; Cholnoky, Eszter; Kuthi, Csaba; Trischler, Ferenc; Hegedus, Bela; Kapolnas nee Pap, Marta; and Kallay nee Sohonyai, Anna, 4,691,017, Cl. 546-298.000.

Vinci, James N.: *See—*
DiBiase, Stephen A.; and Vinci, James N., 4,690,767, Cl. 252-47.000.

Vinogradov, Vasily M.: *See—*
Lozinsky, Miron O.; Bobkov, Jury G.; Shinanjuk, Alla F.; Gevaza, Jury I.; Markovsky, Leonid N.; Kuznetsova, Galina A.; Markin, Valentin A.; Kleimenova, Natalya N.; Tentsova, Antonina I.; Motalov, Alexandr N.; Seredinin, Sergei B.; Katkov, Vladimir F.; Vinogradov, Vasily M.; and Kulinsky, Vladimir I., 4,691,046, Cl. 560-196.000.

Vishnitsky, Alexander, to Cation Corporation. Electrochemical rifling of gun barrels. 4,690,737, Cl. 204-129.700.

Vishnupad, Mohan; and Ramirez, Jose E., to Chesebrough Pond's Inc. Novel translucent water in oil emulsions. 4,690,774, Cl. 252-309.000.

Viskase Corporation: *See—*
Urbutis, Algimantas P., 4,690,173, Cl. 138-118.100.

Vista Chemical Company: *See—*
Resh, Kyle W., 4,691,068, Cl. 585-323.000.

Vistech Corporation: *See—*
Fitzmorris, Tyce; Espenhahn, Eric; and Pereira, Jamie, 4,691,231, Cl. 358-106.000.

Vitaloni, Alberto, to Vitaloni Group S.p.A. Headgear for motorcycling and similar activities, with a movable visor and chin guard. 4,689,836, Cl. 2-424.000.

Vitaloni Group S.p.A.: *See—*
Vitaloni, Alberto, 4,689,836, Cl. 2-424.000.

Vlasak, Weldon R. H., to ITT Gilfillan, a division of ITT Corporation. Data transmission system. 4,691,312, Cl. 370-4.000.

Voelz, Dieter; and Illerhaus, Roland, to Eastman Christensen Company. Changeover bit for extended life, varied formations and steady wear. 4,690,228, Cl. 175-24.000.

Voest-Alpine Aktiengesellschaft: *See—*
Rockenschaub, Walter; and Kepplinger, Werner, 4,690,387, Cl. 266-144.000.

Volkswagen Aktiengesellschaft: *See—*
Hofbauer, Peter; and Sandhagen, Jurgen, 4,690,118, Cl. 123-533.000.

von Ohain, Hans P.: *See—*
Minardi, John E.; and von Ohain, Hans P., 4,689,950, Cl. 60-204.000.

von Sivers, Rolf; Havemann, Kim; and Ilsemann, Bernhard, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Four-wheel drive arrangement for motor vehicles. 4,690,238, Cl. 180-248.000.

Voorheis Industries, Inc.: *See—*
Voorheis, James T., 4,690,639, Cl. 432-105.000.

Voorheis, James T., to Voorheis Industries, Inc. Constant pressure variable orifice burner nozzle assembly. 4,690,639, Cl. 432-105.000.

Vorhis, Daniel J. Self closing squeeze valve. 4,690,375, Cl. 251-342.000.

Voss, Harald; and Rothweiler, Herbert, to Ciba-Geigy Corporation. Pharmaceutical compositions with analgesic properties and the preparation and use thereof. 4,690,927, Cl. 514-282.000.

Vranson, David M.: *See—*
Foglesonger, John D.; and Vranson, David M., 4,689,876, Cl. 29-600.000.

VTC Incorporated: *See—*
Solstad, Russell V., 4,689,875, Cl. 437-211.000.

Vulcan-Hart Corporation: *See—*
Sank, Gerald W., 4,690,127, Cl. 126-391.000.

Vyas, Dolatrai M.; Chiang, Yulin; and Doyle, Terrence W., to Bristol-Myers Company. Amino disulfides. 4,691,023, Cl. 548-422.000.

W. Schlafhorst & Co.: *See—*
Langen, Manfred, 4,690,342, Cl. 242-35.50A.
Wassenhoven, Heinz-Georg, 4,689,946, Cl. 57-301.000.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
Hofler, Siegfried; Rode, Konrad; and Schmidt, Reinhard, 4,689,990, Cl. 73-118.100.
Klatt, Alfred, 4,690,008, Cl. 74-336.00R.

Wada, Toshiaki; Katsuyama, Yoshiaki; and Nakaoka, Junichi, to Sumitomo Special Metals Co., Ltd. Recording disk substrate members and process for producing same. 4,690,846, Cl. 428-64.000.

Wagner, Emery L.: *See—*
Williams, John F.; and Wagner, Emery L., 4,690,669, Cl. 494-14.000.

Wagner, Frederic M.: *See—*
Juaire, Phillip R.; Wagner, Frederic M.; and Wildgen, Leo F., 4,689,917, Cl. 49-380.000.

Wagner, Richard M.: *See—*
Smith, Mark L.; and Wagner, Richard M., 4,690,747, Cl. 204-206.000.

Wahle, Bernd; Freitag, Dieter; Uerdingen, Walter; Heine, Heinrich; and Blazejak, Manfred, to Bayer Aktiengesellschaft. Special epoxy resins. 4,690,998, Cl. 528-96.000.

Wakabayashi, Hiroshi; and Kazami, Kazuyuki, to Nippon Kogaku K. K. Film feeding apparatus for camera. 4,690,533, Cl. 354-173.110.

Wakefield, Barry R.; and Pullen, Francis J., to Devro, Inc. Heat sealing machine. 4,689,854, Cl. 17-1.00R.

Waldron, Mark A.; and Leung, Tommy Y., to CTS Corporation. Multi-speed, full duplex modem. 4,691,342, Cl. 379-98.000.

Walker, David G. Monochlorobiphenyl:cuprous aluminum tetrachloride. 4,691,074, Cl. 585-849.000.

Walker, Ray A., to Spectra-Physics, Inc. Capillary bore straightness inspection. 4,690,556, Cl. 356-152.000.

Wall, Donald W. C-shaped failure detector for steam traps. 4,690,570, Cl. 374-188.000.

Walls, Henry M.; and Sayers, George M., Jr., to TSCO Corporation. Cooking and whistling knob therefor. 4,690,095, Cl. 116-67.00R.

Walsh, Myles A., III; and Morris, R. Scott, to Cape Cod Research, Inc. Electrolytic reactor and method for treating fluids. 4,690,741, Cl. 204-149.000.

Walther, Norbert; Lucas, August; Lorenz, Kurt; and Brum, Engelbert, to Carl Still GmbH & Co. KG, Firma. Hydraulically operated high-pressure piston pump. 4,690,160, Cl. 134-181.000.

Wampfler, David J.; Fielding, Donna J.; and Pawloski, Chester E., to Dow Chemical Company, The. Halogenated phosphorate ethers with flame-retardant polyurethanes. 4,690,954, Cl. 521-107.000.

Wang, John T.: *See*—
Nathan, Vaidy R.; Wang, John T.; and Downes, James E., 4,690,809, Cl. 423-306.000.

Wang, Pen C.; Stuart, Van I. W.; Yates, Ronald L.; and Crain, Steven P., to Dow Chemical Company, The. Aminoalkyl hydantoins and glycidyl derivatives thereof. 4,691,021, Cl. 548-309.000.

Wang, Ting M., to Borg-Warner Automotive, Inc. Variable rate drive strap. 4,689,953, Cl. 60-330.000.

Wareham, John G.: *See*—
Gayfer, David; Starkey, Stanley V.; and Wareham, John G., 4,690,265, Cl. 198-347.000.

Warren, Monty, to Dorfender Products Inc. Bumper strip for automobiles. 4,690,446, Cl. 293-128.000.

Wassenhoven, Heinz-Georg, to W. Schlafhorst & Co. Spinning device for producing a twisted thread. 4,689,946, Cl. 57-301.000.

Watada, Atsuyuki: *See*—
Nakamura, Hitoshi; Kaneko, Yujiro; Sawada, Yasuo; Machida, Hajime; Omi, Fumiya; and Watada, Atsuyuki, 4,690,861, Cl. 428-623.000.

Watanabe, Haruo, to Citizen Watch Co., Ltd. Liquid crystal color display panel with mosaic color filter. 4,690,511, Cl. 350-339.00F.

Watanabe, Hiroshi; Johzuka, Takashi; and Suzuki, Masanobu, to New Japan Radio Co., Ltd. Frequency converter. 4,691,376, Cl. 455-131.000.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming apparatus with a plurality of colors. 4,690,543, Cl. 355-4.000.

Watanabe, Kazuaki: *See*—
Sumiya, Koji; Watanabe, Kazuaki; and Kubo, Seitoku, 4,690,037, Cl. 92-130.00R.

Watanabe, Kenji; Kato, Hiroshi; and Onishi, Katsunori, to Inoue Mtp Kabushiki Kaisha. Apparatus for winding a sheet-formed article. 4,690,348, Cl. 242-66.000.

Watanabe, Kiyoshi: *See*—
Yamane, Takehiko; Hashizume, Takuji; Yamashita, Katsuji; and Watanabe, Kiyoshi, 4,690,919, Cl. 514-183.000.

Watanabe, Masakazu: *See*—
Okuno, Akiyasu; and Watanabe, Masakazu, 4,690,909, Cl. 501-90.000.

Watanabe, Masamichi; and Watanabe, Yasushi, to Alps Electric Co., Ltd. Circuit board. 4,691,188, Cl. 338-307.000.

Watanabe, Shojiro: *See*—
Tanji, Hiroaki; Suzuki, Masaharu; Nomura, Kenji; Watanabe, Shojiro; and Kawasaki, Takashi, 4,690,841, Cl. 428-35.000.

Watanabe, Shyoichi: *See*—
Kikuchi, Hiroshi; Watanabe, Shyoichi; and Ohta, Yukio, 4,690,577, Cl. 400-708.000.

Watanabe, Yasushi: *See*—
Watanabe, Masamichi; and Watanabe, Yasushi, 4,691,188, Cl. 338-307.000.

Watanabe, Yukio: *See*—
Motegi, Nawoto; Watanabe, Yukio; Shimada, Naohiro; and Okajima, Masaki, 4,691,321, Cl. 372-46.000.

Watanave, Takeo: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.

Watkins, James D.; and Andreas, David W., to Golden Valley Microwave Foods Inc. Cooking bag with diagonal gusset seals. 4,691,374, Cl. 383-104.000.

Watts, Mark W.: *See*—
Thaden, Robert C.; and Watts, Mark W., 4,691,289, Cl. 364-518.000.

Wavin B.V.: *See*—
Gaikema, Gjalt M.; and Zylstra, Dirk, 4,689,936, Cl. 53-440.000.

Wayne State University: *See*—
Taylor, John D.; and Hons, Kenneth V., 4,690,935, Cl. 514-356.000.

Weapon Technology System R & D Ltd.: *See*—
Gillum, Richard R., 4,689,912, Cl. 42-105.000.

Weathers, Beryl D. Wood-form splice stake and carrier. 4,690,367, Cl. 249-6.000.

Weber, James L., to Rockwell International Corporation. Brake actuator. 4,690,253, Cl. 188-72.700.

Weber, Robert; Bieselt, Roland; Forner, Siegfried; and Mechtold, Helmut, to Kraftwerk Union Aktiengesellschaft. Fixture for machining the cutting line of a pipe. 4,689,863, Cl. 29-33.00T.

Weber, Roland: *See*—
Einzinger, Josef; Fellinger, Christine; Leipold, Ludwig; Tihanyi, Jenoe; and Weber, Roland, 4,691,129, Cl. 307-581.000.

Webster, James N. Bag stand container. 4,690,357, Cl. 248-99.000.

Weddigen, Gert: *See*—
Flatz, Josef; Weddigen, Gert; Bohme, Hans-Joachim; Grieser, Fritz; Huber, Robert; and Nienburg, Hans, 4,691,082, Cl. 174-106.0SC.

Weed, Lucretia J.: *See*—
DeBruyn, Frank E., Jr.; and Weed, Lucretia J., 4,690,884, Cl. 430-206.000.

Weertz, Klaus: *See*—
Castagna, Wolfgang; Krankenhagen, Jochen; Ortwein, Heinz; and Weertz, Klaus, 4,690,081, Cl. 112-276.000.

Wehr, Michael A.; and Sajdak, Robert L., to United States of America, Agriculture. Portable, self-powered, adjustable herbicide dispensing system. 4,690,309, Cl. 222-249.000.

Wei, Che-Chia: *See*—
Tang, Thomas E.; Wei, Che-Chia; Haken, Roger A.; Holloway, Thomas C.; and Bell, David A., 4,690,730, Cl. 156-643.000.

Weigend, Helmut: *See*—
Morgenstern, Bernd; Weigend, Helmut; and Reinhardt, Peter, 4,690,564, Cl. 356-445.000.

Weigold, Helmut: *See*—
Rebenann, Manfred; and Weigold, Helmut, 4,690,668, Cl. 493-297.000.

Weinhold, Helmut: *See*—
Berleth, Manfred; and Weinhold, Helmut, 4,690,023, Cl. 83-700.000.

Weischedel, Guido, to Robert Bosch GmbH. Speed governing system for a fuel injected internal combustion engine, especially a diesel engine. 4,690,114, Cl. 123-357.000.

Weisenberger, Johannes M.: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; Haarmann, Walter; and Weisenberger, Johannes M., 4,690,923, Cl. 514-222.000.

Welsh, Robert C. Microscope illuminator support. 4,690,522, Cl. 350-528.000.

Wenger, Bruno, to Siemens Aktiengesellschaft. Clock regenerator. 4,691,327, Cl. 375-4.000.

Wente, Gerald: *See*—
Adrian, Willy; and Wente, Gerald, 4,690,264, Cl. 198-335.000.

Wentworth, Robert: *See*—
Belanger, James A.; Wentworth, Robert; and Lapham, James M., 4,690,065, Cl. 104-172.300.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Katzmann, Harald; Senn, Werner; and Ammann, David, 4,690,029, Cl. 86-20.110.

West, John P., to Avon Industrial Polymers Limited. Hydraulically damped mounting device. 4,690,389, Cl. 267-140.100.

Westgate, Wayne P., to Avantek, Inc. Quad-ridge waveguide mixer. 4,691,380, Cl. 455-328.000.

Westinghouse Electric Corp: *See*—
Jenkins, Leonard S., 4,690,612, Cl. 415-112.000.

Westinghouse Electric Corp.: *See*—
Bein, Jeffrey D., 4,690,206, Cl. 165-81.000.
Carris, George M., 4,690,483, Cl. 439-517.000.
Everett, James W., 4,690,172, Cl. 138-89.000.
Grunert, Kurt A.; and Changle, Joseph F., 4,691,180, Cl. 335-6.000.
Hardin, Roy T., Jr.; and Marshall, James R., 4,690,795, Cl. 376-264.000.
Kenny, Thomas J.; and Sutherland, James F., 4,691,263, Cl. 361-58.000.
McCabria, Jack L., 4,691,119, Cl. 307-84.000.
Mrenna, Stephen A.; and Whipple, Michael J., 4,691,182, Cl. 335-176.000.
Nee, John D.; and Hahn, Joseph J., 4,690,593, Cl. 408-80.000.
Odor, Elbert P., 4,690,592, Cl. 408-1.00R.
Sabol, George P.; and Barry, Robert F., 4,690,716, Cl. 148-11.50F.
Savinell, Alan; and Hydeman, Jeffrey E., 4,689,994, Cl. 73-634.000.

Weston, Harry T.: *See*—
Bayruns, Robert J.; and Weston, Harry T., 4,691,331, Cl. 377-47.000.

Wetzel, Robert E., to Dayco Products, Inc. Toothed belt. 4,690,664, Cl. 474-205.000.

Wevelsiep, Klaus. Method and apparatus for omnidirectional reading of data bases. 4,691,367, Cl. 382-61.000.

Weyerhaeuser Company: *See*—
Halabisky, Donald D.; and Dudley, Dwight A., II, 4,690,835, Cl. 427-210.000.
Hasenwinkle, Earl D., 4,690,188, Cl. 144-378.000.
Schmidt, Phillip A., 4,690,187, Cl. 144-340.000.

Whalen, Brian. Multistate differential transmission. 4,690,016, Cl. 74-687.000.

Wheater, Robin A.: *See*—
Clark, Roger J.; Economy, James; Flandera, Mary A.; Susko, John R.; and Wheater, Robin A., 4,690,962, Cl. 524-94.000.

Whipple, Michael J.: *See*—
Mrenna, Stephen A.; and Whipple, Michael J., 4,691,182, Cl. 335-176.000.

Whirlpool Corporation: *See*—
Janke, Donald E.; and Linstromberg, William J., 4,689,965, Cl. 62-155.000.
Lau, Robert G., 4,690,468, Cl. 312-291.000.

White, Anthony M.: *See*—
Elliott, Charles T.; and White, Anthony M., 4,691,107, Cl. 250-370.000.

White, Bernard C., to Napco Industries, Inc. Grenade launcher attachment for infantry weapon. 4,689,911, Cl. 42-105.000.

White, Gary R.: *See*—
Aldrich, Roger B.; and White, Gary R., 4,689,888, Cl. 33-288.000.
White, Justin C.: *See*—
Sayler, William H.; and White, Justin C., 4,690,338, Cl. 241-56.000.
Whittaker Corporation: *See*—
Reinhart, Charles W.; and Mauldin, Robert H., 4,691,080, Cl. 174-88.00R.
Wick, Alexander; Frost, Jonathan; Gaudilliere, Bernard; Bertin, Jean; Dupont, Regis; and Rousseau, Jean, to Synthelabo. Therapeutically useful 1-phenyl-2-piperidinoalkanol derivatives. 4,690,931, Cl. 514-317.000.
Wiggins Teape Group Limited, The: *See*—
Radvan, Bronislaw; and Till, Andrew, 4,690,860, Cl. 428-290.000.
Wiklund, Klas R., to Nicator AB. Arrangement for measuring wheel alignment and steering geometry in an automobile. 4,690,557, Cl. 356-155.000.
Wilcox, John A.: *See*—
Harris, Patrick C.; and Wilcox, John A., 4,691,029, Cl. 549-79.000.
Wildgen, Leo F.: *See*—
Juaire, Phillip R.; Wagner, Frederic M.; and Wildgen, Leo F., 4,689,917, Cl. 49-380.000.
Wildonger, Richard A.: *See*—
Dutta, Anand S.; Stein, Ross L.; Trainor, Diane A.; and Wildonger, Richard A., 4,691,007, Cl. 530-331.000.
Wilkerson Corporation: *See*—
Van Steenburgh, Leon R., Jr., 4,689,969, Cl. 62-474.000.
Wilkins, Cletus W., Jr.: *See*—
Lyons, Alan M.; Mendenhall, Frederick T., Jr.; Robbins, Murray; Quick, Nathaniel R.; and Wilkins, Cletus W., Jr., 4,691,091, Cl. 219-121.0LM.
Wilkinson Sword Limited: *See*—
Duncan, David S., 4,690,018, Cl. 76-101.00R.
Wille, Herbert S.; Przybylinski, Phillip G.; and Raidt, Joe B., to Pullman Standard Inc. Railway car body structural arrangement. 4,690,072, Cl. 105-406.100.
Willetts, Elwood H. Suspension for axle control with empty car spring. 4,690,069, Cl. 105-224.100.
Williams, Gerald J.: *See*—
Niskin, Shale J.; and Williams, Gerald J., 4,690,380, Cl. 254-394.000.
Williams, John F.; and Wagner, Emery L., to Du Pont de Nemours, E. I., and Company. Refrigerated centrifuge having a removable bowl. 4,690,669, Cl. 494-14.000.
Williams, Mary. Hair cutting cape with catch for hair clippings. 4,689,830, Cl. 2-50.000.
Wills, Anthony J., to British Petroleum Company P.L.C., The. Pressure container with thermoplastic fusible plug. 4,690,295, Cl. 220-207.000.
Willson, Carlton G.: *See*—
Hiraoka, Hiroyuki; Labadie, Jeffrey W.; Lee, James H.; MacDonald, Scott A.; and Willson, Carlton G., 4,690,838, Cl. 427-343.000.
Wilson, Stephen T.; Woodard, Naomi A.; and Flanigen, Edith M., to Union Carbide Corporation. Crystalline gallophosphate compositions. 4,690,808, Cl. 423-305.000.
Winchell, David F.: *See*—
Stanley, Keith R.; and Winchell, David F., 4,691,347, Cl. 379-203.000.
Winchester Industries, Inc.: *See*—
Biro, Alexander J., 4,689,933, Cl. 52-656.000.
Winckler, Steven J., to Du Pont de Nemours, E. I., and Company. Apparatus and method for reducing broken fibers on the surface of a carbon fiber yarn bundle. 4,689,947, Cl. 57-304.000.
Windeler, Stanley R.: *See*—
Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., 4,690,552, Cl. 356-35.500.
Windisch, David E. Motion detector suitable for detecting earthquakes and the like. 4,689,997, Cl. 73-652.000.
Wine, Charles M., to RCA Corporation. Compact disk read only memory recording system with speed control. 4,691,310, Cl. 369-50.000.
Wirstrom, Peter; and Cork, William H., to Pirmaasafe, Inc. Interactive security control system for computer communications and the like. 4,691,355, Cl. 380-23.000.
Wiseman, John R.: *See*—
Banks, Henry J.; and Wiseman, John R., 4,690,041, Cl. 98-57.000.
Wismer, Shirlee A.: *See*—
Haunschild, Susan M.; Hata, Stephen S.; and Wismer, Shirlee A., 4,690,681, Cl. 604-396.000.
Witco Corporation: *See*—
Mausner, Marvin L.; and Meinstein, Siegfried, 4,690,785, Cl. 260-505.00N.
Witte, Josef: *See*—
Starzewski, Karl-Heinz A. O.; Witte, Josef; and Bartl, Herbert, 4,691,036, Cl. 556-16.000.
Wittrisch, Christian, to Institut Francais du Petrole. Method and a device for carrying out measurements and/or operations in a well. 4,690,214, Cl. 166-250.000.
Wolcott, Dana W.: *See*—
Hansen, David E.; Kelbe, Richard R.; and Wolcott, Dana W., 4,690,531, Cl. 354-149.110.
Wolf, Barry M.: *See*—
Solcz, Edward J.; Domoto, Gerald A.; and Wolf, Barry M., 4,691,212, Cl. 346-108.000.
Wolfe, John N.: *See*—
Gabriele, Joseph M.; Sam, George J., Sr.; Wolfe, John N.; and Parekh, Navinchandra J., 4,691,333, Cl. 378-37.000.
Wolff, Pieter, to Siemens Aktiengesellschaft. Circuit arrangement for receiving and/or transmitting serially appearing binary signals in or from a processing device containing a microcomputer or a microprocessor. 4,691,297, Cl. 364-900.000.
Wolfram, Stephen, to Thinking Machines Corporation. Random sequence generators. 4,691,291, Cl. 364-717.000.
Wolfstieg, Ulrich M. E. A., to U.S. Philips Corporation. X-ray examination apparatus. 4,691,334, Cl. 378-71.000.
Wolniak, Stanley C.; and Laabs, Timothy P., to Eastern Company, The. Switch lock with two momentary positions. 4,689,977, Cl. 70-379.00R.
Won, Richard, to Advanced Polymer Systems, Inc. Method for delivering an active ingredient by controlled time release utilizing a novel delivery vehicle which can be prepared by a process utilizing the active ingredient as a porogen. 4,690,825, Cl. 424-501.000.
Wong, Ming K.: *See*—
Redman, Michael J.; Wong, Ming K.; and Sugden, Peter R., 4,691,339, Cl. 379-62.000.
Wong, Mon N.; and Peebles, Ann L., to Hughes Aircraft Company. Waveguide switch with variable short wall coupling. 4,691,177, Cl. 333-113.000.
Wood, Colin: *See*—
Shapter, Hugh; and Wood, Colin, 4,691,206, Cl. 343-700.0MS.
Woodard, Naomi A.: *See*—
Wilson, Stephen T.; Woodard, Naomi A.; and Flanigen, Edith M., 4,690,808, Cl. 423-305.000.
Woodburn, Robert W.: *See*—
Choate, Paul V.; and Woodburn, Robert W., 4,689,910, Cl. 42-100.000.
Woodford, Timothy; and Cheraso, John. Vented syringe. 4,690,154, Cl. 128-765.000.
Woods, David E. Insulated cooler for beverage containers. 4,690,300, Cl. 220-412.000.
Worthington, Paul A.; and Shephard, Margaret C., to Imperial Chemical Industries PLC. Certain triazole compounds and their use as fungicides. 4,690,941, Cl. 514-383.000.
Wright, Forrest S.: *See*—
Grant, Ralph M.; Haskell, Richard E.; Paskus, Anthony; Windeler, Stanley R.; and Wright, Forrest S., 4,690,552, Cl. 356-35.500.
Wright, James D. Fastener for a readily disengageable interior panel. 4,689,929, Cl. 52-239.000.
Wright, Robert V.: *See*—
Alexander, Garold W.; Hyder, Lonnie E.; and Wright, Robert V., 4,690,666, Cl. 493-152.000.
Wuerthner, Hubert: *See*—
Spitaler, Englebert; and Wuerthner, Hubert, 4,690,424, Cl. 280-633.000.
Wuiff, Hans-Jurgen, to Licentia Patent-Verwaltungs-GmbH. Bimetal releaser. 4,691,184, Cl. 337-49.000.
Wydler, Peter, to Alos AG. Apparatus for the detection of optical marks on a film support moved relative to the apparatus. 4,691,112, Cl. 250-570.000.
Xerox Corporation: *See*—
Coons, Robert A., Jr., 4,690,392, Cl. 271-2.000.
Forbes, Richard L., II; and Thorp, Bruce E., 4,690,544, Cl. 355-15.000.
Manno, Eugene J., 4,690,540, Cl. 355-3.0DD.
Miazga, Dennis E.; and Petery, James J., 4,691,317, Cl. 371-20.000.
Radulski, Charles A.; and Till, Henry R., 4,690,539, Cl. 355-3.0TR.
Solcz, Edward J.; Domoto, Gerald A.; and Wolf, Barry M., 4,691,212, Cl. 346-108.000.
Stephany, Joseph F., 4,691,200, Cl. 340-784.000.
Stoffel, James C.; and Tandon, Jagdish C., 4,690,391, Cl. 269-21.000.
Xolox Corporation: *See*—
Loubier, Robert J.; and Bleeke, William F., 4,691,185, Cl. 338-32.00H.
Xomox Corporation: *See*—
Gardner, John F.; and Morton, Gerald H., 4,690,164, Cl. 137-15.000.
Yada, Akira; Matsumoto, Shusaku; Kawamori, Yoshihiro; Saito, Takao; Nishiyama, Tadashi; and Adachi, Yoshitugu, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Process for preparing water-soluble polymer gel particles. 4,690,788, Cl. 264-22.000.
Yagihara, Morio; and Ikegawa, Akihiko, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,690,885, Cl. 430-212.000.
Yale, Ramon L., to GTE Products Corporation. Process for providing hydrolysis resistant phosphors. 4,690,832, Cl. 427-65.000.
Yamada, Kenichi: *See*—
Sakai, Yasuhito; and Yamada, Kenichi, 4,690,011, Cl. 74-475.000.
Yamada, Mitsuhiko, to Dainippon Screen Mfg. Co., Ltd. Method and apparatus of storing image data into a memory in a layout scanner system. 4,691,238, Cl. 358-280.000.
Yamada, Mutsuo; Nishimura, Yasuyuki; Arikawa, Yoshijiro; Kuwahara, Takanori; Kamiguchi, Taiji; and Tanimoto, Hirotoshi, to Babcock-Hitachi Kabushiki Kaisha. Process for producing organic compounds by utilizing oxygenic complexes. 4,691,053, Cl. 562-531.000.
Yamada, Toshiyuki: *See*—
Funabashi, Katsunori; Nakashima, Tai; Yamada, Toshiyuki; and Morishima, Kazuo, 4,690,237, Cl. 180-219.000.
Yamada, Yosuke; and Oogami, Mitsuhiro, to Daiwa Special Chemical Co., Ltd. Washing apparatus. 4,690,158, Cl. 134-107.000.
Yamaguchi, Shigeru: *See*—
Fukuchi, Shuzo; and Yamaguchi, Shigeru, 4,691,045, Cl. 560-185.000.

Yamaguchi, Yoshimitsu; Shibata, Tadahiko; Suzuki, Masanori; and Toda, Takezi, to Nippondenso Co. Ltd. Device for supplying a long length of material. 4,690,349, Cl. 242-75.500.

Yamaguchikyoei Industry Co. Ltd.: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Takada, Kazuyoshi, 4,690,234, Cl. 180-182.000.

Yamaichi Electric Mfg. Co., Ltd.: *See*—
Sibata, Suegi, 4,690,646, Cl. 439-71.000.

Yamaki, Toshio: *See*—
Nakai, Masaaki; Izumi, Shuji; Fujino, Akihiko; Taniguchi, Nobuyuki; Yamaki, Toshio; and Mukai, Hiromu, 4,690,536, Cl. 354-402.000.

Yamamitsu, Chojuro: *See*—
Juri, Tatsuro; Iketani, Akira; Yamamitsu, Chojuro; and Ide, Akifumi, 4,691,329, Cl. 375-122.000.

Yamamoto, Kazuyuki: *See*—
Kumakawa, Shiro; and Yamamoto, Kazuyuki, 4,690,866, Cl. 428-364.000.

Yamamoto, Kunihiko: *See*—
Takamatsu, Toshiaki; Kuwagaki, Hiroshi; Minezaki, Shigehiro; Yamamoto, Kunihiko; Nakatani, Hiroshi; and Kawaguchi, Hisao, 4,690,510, Cl. 350-334.000.

Yamamoto, Makoto: *See*—
Naito, Takanobu; Yokoyama, Masaaki; Sasaki, Kazuya; Yamamoto, Makoto; and Amemiya, Kouji, 4,691,014, Cl. 540-227.000.

Yamamoto, Mitsuo: *See*—
Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, 4,690,867, Cl. 428-367.000.

Yamamoto, Motohiro: *See*—
Kida, Tohru; and Yamamoto, Motohiro, 4,690,811, Cl. 423-345.000.

Yamamoto, Nobuyuki: *See*—
Miyoshi, Takahito; Fujiyama, Masaaki; Matsufuji, Akihiro; and Yamamoto, Nobuyuki, 4,690,863, Cl. 428-328.000.

Yamamoto, Saburo: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,691,214, Cl. 357-17.000.

Yamamoto, Tsutomu; Nishiyama, Michio; Yamamoto, Mitsuo; and Ozaki, Masakazu, to Nichias Corporation. Material for low melting point metal casting equipment. 4,690,867, Cl. 428-367.000.

Yamamoto, Yasuhiko: *See*—
Kubo, Kanji; Asanuma, Nobuyoshi; Saito, Kazuo; and Yamamoto, Yasuhiko, 4,690,426, Cl. 280-690.000.

Yamamoto, Yoshiharu: *See*—
Nakajima, Yasuo; Yamamoto, Yoshiharu; Miyatake, Yoshito; Nagaoka, Yoshitomi; and Ono, Shusuke, 4,690,515, Cl. 350-432.000.

Yamane, Kunio; Ohmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, to Yamane, Kunio; Calpis Food Industry Co., Ltd., The; Daicel Chemical Industries, Ltd.; and Oji Corn Starch Co., Ltd. DNA coding for a signal peptide and DNA containing the same. 4,690,898, Cl. 435-320.000.

Yamane, Shigeki; Mori, Keijiro; and Sakamoto, Kyooya, to Matsushita Electric Industrial Co., Ltd.; and Matsushita Seiko Co., Ltd. PWM inverter apparatus. 4,691,269, Cl. 363-41.000.

Yamane, Takehiko; Hashizume, Takuji; Yamashita, Katsuji; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Benzoxazinorifamycin derivative, process for preparing the same and antibacterial agent containing the same. 4,690,919, Cl. 514-183.000.

Yamanouchi Pharmaceutical Co., Inc.: *See*—
Kagatani, Seiya; Hasumi, Shunji; Sonobe, Takashi; and Aruga, Masayoshi, 4,690,952, Cl. 514-808.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Kojima, Tadao; Kageyama, Shunji; Okada, Minoru; Ohata, Isao; and Sato, Noboru, 4,690,932, Cl. 514-337.000.
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.

Yamasaki, Taro: *See*—
Fukamizu, Hiroshi; Nakano, Masaji; Iba, Kunio; Yamasaki, Taro; and Sano, Kenji, 4,690,553, Cl. 356-51.000.

Yamashita, Katsuji: *See*—
Yamane, Takehiko; Hashizume, Takuji; Yamashita, Katsuji; and Watanabe, Kiyoshi, 4,690,919, Cl. 514-183.000.

Yamashita, Yasuhiro: *See*—
Mori, Takashi; Ohi, Nobuhiro; Ohsugi, Yoshiyuki; and Yamashita, Yasuhiro, 4,691,018, Cl. 546-309.000.

Yamauchi, Fumio; Tohara, Tsutomu; Nakano, Shigeo; and Emoto. Shigeo, to Nippon Electric Co., Ltd. Vibration damping material. 4,690,960, Cl. 523-442.000.

Yamaya, Masaaki: *See*—
Terae, Nobuyuki; Yamaya, Masaaki; and Okada, Fumio, 4,690,713, Cl. 106-287.160.

Yamazaki, Atsuki: *See*—
Shibanuma, Tadao; Nagano, Noriaki; Hara, Ryuichiro; Nakano, Kohji; Koda, Akio; Yamazaki, Atsuki; and Murakami, Yukiyasu, 4,690,921, Cl. 514-205.000.

Yamazaki, Hisato: *See*—
Yamane, Kunio; Ohmura, Kazutaka; Yamazaki, Hisato; and Shiroza, Teruaki, 4,690,898, Cl. 435-320.000.

Yamazaki, Mitsuo: *See*—
Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, 4,691,027, Cl. 549-32.000.

Yamazaki, Shiro: *See*—
Aoki, Katsumichi; Shida, Takafumi; Arabori, Hideo; Kumazawa, Satoru; Shimizue, Susumu; Watanave, Takeo; Kanda, Yohichi; Satake, Keigo; Yamazaki, Shiro; Shinkawa, Hiroyasu; and Chida, Tsuneaki, 4,690,704, Cl. 71-90.000.

Yamazaki, Shumpei, to Semiconductor Energy Laboratory Co., Ltd. Method of making semiconductor device. 4,690,717, Cl. 437-2.000.

Yamazaki, Tatsu: *See*—
Kosaka, Masato; and Yamazaki, Tatsu, 4,690,036, Cl. 91-506.000.

Yanagase, Akira: *See*—
Sasaki, Isao; Yanagase, Akira; Kawachi, Yasunori; Mayuzumi, Tetsuya; Oba, Toshio; and Okada, Fumio, 4,690,986, Cl. 525-479.000.

Yanagida, Takehiko: *See*—
Kuwahara, Heikichi; Takahashi, Kenji; Yanagida, Takehiko; Nakayama, Wataru; Sugimoto, Shigeo; and Oizumi, Kiyoshi, 4,690,211, Cl. 165-177.000.

Yanagita, Makoto: *See*—
Sekimoto, Yukihiko; Yanagita, Makoto; and Kanda, Shoichi, 4,691,013, Cl. 536-96.000.

Yaniv, Zvi: *See*—
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., 4,691,243, Cl. 358-294.000.
Cannella, Vincent D.; Yaniv, Zvi; and Johnson, Robert R., 4,691,244, Cl. 358-294.000.

Yano, Kazuo: *See*—
Yoshihara, Masashi; and Yano, Kazuo, 4,691,377, Cl. 455-256.000.

Yap, Raymond C. C.: *See*—
Lacoste, Olivier H. V.; De Regel, Alain; Fujiwara, Hidenori; and Yap, Raymond C. C., 4,690,958, Cl. 523-172.000.

Yarbrough, J. W.: *See*—
Stanley, Frankie B., 4,689,972, Cl. 68-20.000.

Yarus, Michael J.: *See*—
Squires, Charles H.; Heefner, Donald L.; Evans, Ronald J.; Kopp, Beatrice J.; and Yarus, Michael J., 4,690,897, Cl. 435-320.000.

Yasuda, Satoshi: *See*—
Ohguma, Hirotsugu; Harada, Mitsuo; Saura, Hideaki; and Yasuda, Satoshi, 4,689,970, Cl. 62-514.00R.

Yasuda, Tomio: *See*—
Hitachi, Ltd.; Okamura, Hisanori; Miyazaki, Kunio; Akiyama, Hirosi; Itoh, Shinichi; Yasuda, Tomio; Nakamura, Kousuke; Okoshi, Yukio; Kamoshita, Mutuo; and Chiba, Akio, 4,690,793, Cl. 376-136.000.

Yasukawa, Masao, to Toyota Jidosha Kabushiki Kaisha. Cylinder head with inwardly projecting cup plug in casting sand extraction hole for speeding up coolant flow. 4,690,104, Cl. 123-41.320.

Yasutomi, Tsuyoshi: *See*—
Nishiguchi, Yasuo; Yasutomi, Tsuyoshi; and Shiraishi, Ryoichi, 4,691,210, Cl. 346-76.0PH.

Yates, Ronald L.: *See*—
Wang, Pen C.; Stuart, Van I. W.; Yates, Ronald L.; and Crain, Steven P., 4,691,021, Cl. 548-309.000.

Yatsuo, Tsutomu: *See*—
Murakami, Susumu; Kagami, Teruyuki; Yatsuo, Tsutomu; and Takahashi, Masaaki, 4,691,223, Cl. 357-51.000.

Yau, Leopoldo D.: *See*—
Tsang, Chi-Hwa; Kawamoto, Galen; and Yau, Leopoldo D., 4,690,728, Cl. 156-643.000.

Yazaki Industrial Chemical Co., Ltd.: *See*—
Yokota, Mamoru, 4,690,344, Cl. 242-55.530.

Yeager, Patrick F.: *See*—
Hollyday, Robert D.; and Yeager, Patrick F., 4,690,479, Cl. 439-97.000.

Yeater, Robert P.: *See*—
Schmidt, Manfred; and Yeater, Robert P., 4,690,964, Cl. 524-125.000.

Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,690,734, Cl. 203-56.000.

Yoder, Jerry L. Tagging stick. 4,690,404, Cl. 273-67.00R.

Yokokawa, Kiyoshi; and Koya, Kazuo, to Shin-Etsu Chemical Co., Ltd. Quartz glass-made optical fibers and a method for the preparation thereof. 4,690,504, Cl. 350-96.340.

Yokomori, Shinji, to Fuji Electric Co., Ltd. Coin refund signal generator. 4,690,263, Cl. 194-317.000.

Yokota, Mamoru, to Yazaki Industrial Chemical Co., Ltd. Roll holder. 4,690,344, Cl. 242-55.530.

Yokota, Yukio: *See*—
Saito, Naoki; Aoki, Kozo; and Yokota, Yukio, 4,690,889, Cl. 430-552.000.

Yokoya, Yuji: *See*—
Sogabe, Ichita; Murata, Syuuji; and Yokoya, Yuji, 4,691,135, Cl. 310-254.000.

Yokoyama, Goro: *See*—
Hirata, Yasushi; Kondo, Hitoshi; Yokoyama, Goro; and Ohara, Masaki, 4,690,965, Cl. 524-236.000.

Yokoyama, Masaaki: *See*—
Naito, Takanobu; Yokoyama, Masaaki; Sasaki, Kazuya; Yamamoto, Makoto; and Amemiya, Kouji, 4,691,014, Cl. 540-227.000.

Yoneyama, Kimiya: *See*—
Kobayashi, Masashi; Takahashi, Keishi; and Yoneyama, Kimiya, 4,691,258, Cl. 360-97.000.

Yoon, Hee K.: *See*—
Kammerer, Gene W.; Yoon, Hee K.; and Sun, Robert Li-Jiun, 4,690,842, Cl. 428-35.000.

Yoshida, Hiroshi; Konishi, Kenji; Koike, Kengo; Nakagawa, Taizo; Shimano, Shizuo; and Mochizuki, Seiji, to Nippon Kayaku Kabushiki Kaisha. N-phenylsulfonylisonicotinamide derivatives and their use as fungicides or bactericides. 4,690,934, Cl. 514-354.000.

Yoshida, Katunori, to Nippon Light Metal Co., Ltd. Inspection car for bridge construction of a high level road. 4,690,247, Cl. 182-63.000.
Yoshida Kogyo K. K.: *See*—
Horikawa, Yoichi, 4,690,629, Cl. 425-156.000.
Yoshida, Minoru: *See*—
Beppu, Teruhiko; Iwamoto, Yasushi; and Yoshida, Minoru, 4,690,918, Cl. 514-23.000.
Yoshida, Mitsuo; Mizuno, Yoshikuni; Shimizu, Natsue; Otsuka, Mieko; Dobutsu, Masakatsu; Furukawa, Yuusuke; and Joshita, Yutaka, to Sumitomo Pharmaceuticals Company, Limited. Therapeutic drug for dementia. 4,690,949, Cl. 514-561.000.
Yoshida, Ryo: *See*—
Takemoto, Ichiki; Sumida, Seizo; Yoshida, Ryo; and Kamoshita, Katsuzo, 4,690,709, Cl. 71-120.000.
Yoshida, Takaichi, to G-C Dental Industrial Corp. Superelastic dental Au-Cu-Zn alloys. 4,690,799, Cl. 420-507.000.
Yoshihara, Masashi; and Yano, Kazuo, to NEC Corporation. Automatic frequency and gain control circuit. 4,691,377, Cl. 455-256.000.
Yoshikawa, Kikuo: *See*—
Hasegawa, Isao; Yoshikawa, Kikuo; Takagi, Satoshi; and Takahashi, Akira, 4,691,261, Cl. 360-137.000.
Yoshikawa, Sadao; Saburi, Masahiko; Ikariya, Takao; Ishii, Youichi; and Akutagawa, Susumu, to Takasago Perfumery Co., Ltd. Ruthenium-phosphine complex. 4,691,037, Cl. 556-18.000.
Yoshikumi, Chikao: *See*—
Kanno, Akihiko; Muto, Shigeaki; Niimura, Koichi; Ando, Takao; Fujii, Takayoshi; Fujii, Masahiko; Furusho, Takao; and Yoshikumi, Chikao, 4,690,920, Cl. 514-201.000.
Yoshimura, Hiroshi: *See*—
Nakagawa, Fumio; Nakamura, Kazuyoshi; Shibao, Hitoshi; Yoshimura, Hiroshi; Taki, Koichi; Inoue, Makoto; Hayashi, Eiji; Dejima, Fusao; and Kohara, Yuritoshi, 4,690,638, Cl. 432-81.000.
Yoshimura, Shoji: *See*—
Ogura, Haruo; Furuhata, Kimio; Osawa, Toshiaki; Toyoshima, Satoshi; Shitori, Yoshiyasu; Ito, Masayoshi; and Yoshimura, Shoji, 4,691,012, Cl. 536-23.000.
Yoshinaka, Toshio: *See*—
Nagano, Shuji; Ida, Shuichiro; Yoshinaka, Toshio; and Okuda, Shozo, 4,690,015, Cl. 74-665.0GE.
Yoshino, Yasuhisa; and Osada, Masahiko, to Nippon Soken, Inc. Speaker changeover device. 4,691,361, Cl. 381-81.000.
Yoshio, Arakawa, to Murata Manufacturing Co., Ltd. Electric doublelayer capacitor. 4,691,266, Cl. 361-433.000.
Yoshioka, Takao; Kitazawa, Eiichi; Yamazaki, Mitsuo; and Iizuka, Yoshio, to Sankyo Company, Limited. 1,3-benzoxathiole derivatives. 4,691,027, Cl. 549-32.000.
Yugen Kaisha Shinjoseisakusho: *See*—
Shinjo, Katsumi, 4,690,599, Cl. 411-180.000.
Yuhashi, Yukio: *See*—
Teraoka, Masao; and Yuhashi, Yukio, 4,690,258, Cl. 192-58.00C.
Yui, Hiroshi: *See*—
Narumiya, Yoshikazu; Hashimoto, Yasuo; Yui, Hiroshi; and Kageyama, Yoshiteru, 4,690,778, Cl. 252-506.000.
Zahnraderfabrik Renk AG: *See*—
Peter, Rudolf; Jahnel, Ernst; and Kunz, Hans-Peter, 4,690,261, Cl. 192-87.130.
Zak, Deborah K. Travel case with screw-in containers. 4,690,271, Cl. 200-1.700.
Zarr, William A.: *See*—
Grosso, Vincent A.; Estlick, Raymond J.; and Zarr, William A., 4,690,350, Cl. 244-3.100.
Zazzu, Victor: *See*—
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,691,189, Cl. 340-347.0AD.
Zebley, Raymond S.; Nichols, James H., Jr.; and Ciosek, Bernard M., Jr., to Du Pont de Nemours, E. I., and Company. Package and apparatus for dispensing electrical connectors. 4,690,302, Cl. 221-11.000.
Zeck, Walter M.; and Simonet, Donald E., to Mobay Corporation. Synergistic composition for the control of arthropods. 4,690,947, Cl. 514-521.000.
Zeigler, Theodore R. Portable shelter assemblies. 4,689,932, Cl. 52-648.000.
Zeilon, Sten O. Closed intermittent drying process. 4,689,894, Cl. 34-13.000.
Zeimet, Richard E. Center stern outboard motor mount for double-end canoes. 4,690,649, Cl. 440-6.000.
Zenith Electronics Corporation: *See*—
Palminteri, Craig R., 4,691,354, Cl. 380-15.000.
Zerrer, Gerhard: *See*—
Kottke, Joachim; and Zerrer, Gerhard, 4,690,252, Cl. 188-69.000.
Zetterquist, Norman E.: *See*—
McInerney, Edward J.; Dornseif, E. Ronald; and Zetterquist, Norman E., 4,690,746, Cl. 204-192.320.
Zielinski, Erich: *See*—
Calver, John G.; Pearce, Phillip W.; and Zielinski, Erich, 4,691,265, Cl. 361-386.000.
Metz, Josef; Pehker, Manfred; and Zielinski, Erich, 4,690,031, Cl. 89-36.130.
Zimmerman, John M.; Noren, Gerry K.; and Bishop, Timothy E., to DeSoto, Inc. Ultraviolet curable optical glass fiber coatings from acrylate terminated, end-branched polyurethane polyurea oligomers. 4,690,501, Cl. 350-96.290.
Zimmerman, John M.; and Bishop, Timothy E., to DeSoto, Inc. Ultraviolet curable optical glass fiber coatings from acrylate terminated, end-branched polyurethane polyurea oligomers. 4,690,502, Cl. 350-96.290.
Zimmermann, Micha, to Newport Corporation. Mounting systems for objects and optical components. 4,690,507, Cl. 350-321.000.
Zobl, Gunter: *See*—
Maul, Bernhard; Zobl, Gunter; and Kusch, Hans-Jurgen, 4,690,394, Cl. 271-11.000.
Zoppa, Dieter, to PKM Verpackungssysteme GmbH & Co. Automatic wrapping machine comprising a tensioning and fastening device. 4,689,938, Cl. 53-582.000.
Zotos International, Inc.: *See*—
Giuliano, James T., 4,690,369, Cl. 249-55.000.
Zylstra, Dirk: *See*—
Gaikema, Gjalt M.; and Zylstra, Dirk, 4,689,936, Cl. 53-440.000.
501 Hamilton/Thorn Research Associates: *See*—
Douglas-Hamilton, Margaret M., 4,690,678, Cl. 604-349.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF SEPTEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Chevron Research Company: *See*—
Luo, Tatao, Re. 32,489, Cl. 71-98.000.

Fujimoto, Masaharu: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.

Gustilo, Ramon B.; and Kyle, Richard F. Hip prosthesis. Re. 32,488, Cl. 623-23.000.

Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, to Yamanouchi Pharmaceutical Co., Ltd. Process for the preparation of 7α-methoxy-7β-(1,3-diethietane-2-carboxyamido)cephalosporanic acid derivatives. Re. 32,491, Cl. 540-221.000.

Jenkins, William A., to Monarch Marking Systems, Inc. Method of making a composite label web. Re. 32,490, Cl. 156-250.000.

Kalaugher, Patrick G., to University of Exeter. Binocular presentation of visual information. Re. 32,487, Cl. 350-145.000.

Kyle, Richard F.: *See*—
Gustilo, Ramon B.; and Kyle, Richard F., Re. 32,488, Cl. 623-23.000.

Luo, Tatao, to Chevron Research Company. Herbicidal substituted 2-(1-(oxyamino)-alkylidene)-cyclohexane-1,3-diones. Re. 32,489, Cl. 71-98.000.

Maeda, Tetsuya: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.

Monarch Marking Systems, Inc.: *See*—
Jenkins, William A., Re. 32,490, Cl. 156-250.000.

Nagano, Noriaki: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.

Nagano, Yoshinobu: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.

Raidel, John E., Jr. Vehicle suspension with rigid torque beam. Re. 32,486, Cl. 280-711.000.

University of Exeter: *See*—
Kalaugher, Patrick G., Re. 32,487, Cl. 350-145.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.

Yamazaki, Atsuki: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, Re. 32,491, Cl. 540-221.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Electro-Plasma, Inc.: *See*—

Muehlberger, Erich; and Kremith, Roland D., B1 4,328,257, Cl. 427-34.000.

Kremith, Roland D.: *See*—
Muehlberger, Erich; and Kremith, Roland D., B1 4,328,257, Cl. 427-34.000.

Muehlberger, Erich; and Kremith, Roland D., to Electro-Plasma, Inc. System and method for plasma coating. B1 4,328,257, 9-1-87, Cl. 427-34.000.

LIST OF DESIGN PATENTEES

Actron Mfg., Inc.: *See*—
Rechberg, Robert, 291,636, Cl. D6-510.000.

Aihara, Akira, to Canon Kabushiki Kaisha. Personal computer. 291,694, 9-1-87, Cl. D14-100.000.

Aikins, Jerry L., to Zimmer, Inc. Prosthetic joint implant for a finger or toe or the like. 291,731, 9-1-87, Cl. D24-33.000.

Alpine, Denice C. Airfoil fin for surfboards. 291,715, 9-1-87, Cl. D21-236.000.

Amco Corporation: *See*—
Bruno, Pasquale, 291,645, Cl. D7-321.000.

Autophon AG: *See*—
Fellmann, Hansruedi, 291,691, Cl. D14-58.000.

Avalon Corporation International: *See*—
Desautels, John F., 291,727, Cl. D23-128.000.

Bartz, Richard O.: *See*—
Sieg, William F.; and Bartz, Richard O., 291,651, Cl. D8-98.000.

Belden, Walter R. Belt buckle rack. 291,629, 9-1-87, Cl. D6-316.000.

Bialo, Walter, to Ventura Travelware, Inc. Attache case or similar article. 291,624, 9-1-87, Cl. D3-76.000.

Bialo, Walter, to Ventura Travelware, Inc. Attache case or similar article. 291,625, 9-1-87, Cl. D3-76.000.

Bialo, Walter, to Ventura Travelware, Inc. Luggage lock. 291,653, 9-1-87, Cl. D8-331.000.

Billups, Larry. Aquarium. 291,735, 9-1-87, Cl. D30-8.000.

Brooks, Kevin C. Fairground amusement tunnel. 291,717, 9-1-87, Cl. D21-242.000.

Bruno, Pasquale, to Amco Corporation. Cooking oil can. 291,645, 9-1-87, Cl. D7-321.000.

Bruns, Eugene C.: *See*—
Klette, John T.; Smith, Harry O.; and Bruns, Eugene C., 291,658, Cl. D9-352.000.

Burin, Ralph R., to Wilton Enterprises, Inc. Spice rack. 291,637, 9-1-87, Cl. D6-514.000.

Bussell, Vanda J. Lotion dispensing bottle. 291,656, 9-1-87, Cl. D9-300.000.

Canon Kabushiki Kaisha: *See*—
Aihara, Akira, 291,694, Cl. D14-100.000.
Hirooka, Junji; and Murakami, Osamu, 291,698, Cl. D14-114.000.

Carr, Christopher; and Witt, James J., Jr., to Procter & Gamble Company, The. Inner pack bottle carrier. 291,657, 9-1-87, Cl. D9-344.000.

Cassini, Oleg L. Perfume bottle. 291,660, 9-1-87, Cl. D9-384.000.

Chap, John P., to Selfix, Inc. Hook fixture. 291,630, 9-1-87, Cl. D6-323.000.

Chap, John P., to Selfix, Inc. Soap dish. 291,638, 9-1-87, Cl. D6-540.000.

Chap, John P., to Selfix, Inc. Towel bar. 291,639, 9-1-87, Cl. D6-549.000.

Collins, Walter W., to Gerber Legendary Blades, Inc. Sheath. 291,626, 9-1-87, Cl. D3-102.000.

Collins, Walter W., to Gerber Legendary Blades, Inc. Knife pouch. 291,627, 9-1-87, Cl. D3-102.000.
Davis, Troy B. Toy water wheel. 291,709, 9-1-87, Cl. D21-59.000.
de Boer, Peter. Chair. 291,631, 9-1-87, Cl. D6-366.000.
Denny, Thomas, to Johnson & Johnson Products Inc. Surgical laparotomy pad. 291,732, 9-1-87, Cl. D24-34.000.
Denny, Thomas, to Johnson & Johnson Products Inc. Surgical laparotomy pad. 291,733, 9-1-87, Cl. D24-34.000.
Desautels, John F., to Avalon Corporation International. Stove door. 291,727, 9-1-87, Cl. D23-128.000.
Dickman, Benjamin. Portable tray for attachment to a beach umbrella. 291,635, 9-1-87, Cl. D6-509.000.
Direct Jewellery Inc.: *See*—
Gozlan, Claude, 291,666, Cl. D11-84.000.
Dixon, Robert. Spider machine toy. 291,711, 9-1-87, Cl. D21-185.000.
Duffin, Thorvald E., II, to TDA, Inc. Personal computer keyboard template for displaying operating instructions for software program. 291,697, 9-1-87, Cl. D14-114.000.
Duffin, Thorvald E., II, to TDA, Inc. Personal computer keyboard template for displaying operating instructions for software program. 291,699, 9-1-87, Cl. D14-114.000.
Eldershaw, Michael K.: *See*—
Read, Clifford D.; and Eldershaw, Michael K., 291,692, Cl. D14-60.000.
Environmental Production Systems Company: *See*—
Ucros, Raphael, 291,634, Cl. D6-491.000.
Ericksen, Craig A. Insulated belt carrier for beverage cans. 291,623, 9-1-87, Cl. D2-630.000.
Everts, Ramon L., to Ford Motor Company. Station wagon rear bumper. 291,677, 9-1-87, Cl. D12-169.000.
Everts, Ramon L., to Ford Motor Company. Automobile front bumper. 291,678, 9-1-87, Cl. D12-169.000.
Everts, Ramon L., to Ford Motor Company. Automobile rear bumper. 291,679, 9-1-87, Cl. D12-169.000.
Everts, Ramon L., to Ford Motor Company. Automobile valance panel. 291,680, 9-1-87, Cl. D12-190.000.
Everts, Ramon L., to Ford Motor Company. Automobile valance panel. 291,681, 9-1-87, Cl. D12-190.000.
Farhi, Moshe. Mold to be used in the manufacture of concrete ceilings. 291,700, 9-1-87, Cl. D15-136.000.
Farhi, Moshe. Inner surface of a mold to be used in the manufacture of concrete ceilings. 291,701, 9-1-87, Cl. D15-136.000.
Farley, Mahin J. Jewelry rack. 291,641, 9-1-87, Cl. D6-566.000.
Fellmann, Hansruedi, to Autophon AG. Combined handset and stand telephone unit. 291,691, 9-1-87, Cl. D14-58.000.
Fink, Cameron; Schram, Robert W.; and Gentile, Anthony, to Sterling Marking Products Inc. Seal press. 291,703, 9-1-87, Cl. D18-15.000.
Fisher Scientific Company: *See*—
Kelln, Norman G.; and Tiffany, Thomas O., 291,730, Cl. D24-29.000.
Fisher Scientific Group Inc.: *See*—
Hoyt, Garry, 291,728, Cl. D24-27.000.
Ford Motor Company: *See*—
Everts, Ramon L., 291,677, Cl. D12-169.000.
Everts, Ramon L., 291,678, Cl. D12-169.000.
Everts, Ramon L., 291,679, Cl. D12-169.000.
Everts, Ramon L., 291,680, Cl. D12-190.000.
Everts, Ramon L., 291,681, Cl. D12-190.000.
Foster, Thomas W., Jr. Sled for a reinforcing cage or the like. 291,654, 9-1-87, Cl. D8-349.000.
Gentile, Anthony: *See*—
Fink, Cameron; Schram, Robert W.; and Gentile, Anthony, 291,703, Cl. D18-15.000.
Georges, Calame G. C.; Zintzmeyer, Jorg; and Lux, Peter G. C. Sign. 291,706, 9-1-87, Cl. D20-42.000.
Gerber Legendary Blades, Inc.: *See*—
Collins, Walter W., 291,626, Cl. D3-102.000.
Collins, Walter W., 291,627, Cl. D3-102.000.
Gisiger, Urs. Zipper closure lock. 291,652, 9-1-87, Cl. D8-331.000.
Goncze, Zoltan; Ogden, Andrew M.; and Kong, Stanley Y., to Vemco Corporation. Track type drafting machine. 291,662, 9-1-87, Cl. D10-63.000.
Gozlan, Claude, to Direct Jewellery Inc. Jewellery pendant. 291,666, 9-1-87, Cl. D11-84.000.
Gray, Bonnie. Decorative toe cover. 291,622, 9-1-87, Cl. D2-330.000.
Greig, Kevin M., to Zimmer, Inc. Spinal hook distractor or the like. 291,729, 9-1-87, Cl. D24-27.000.
Hellmer, Robert N.; and Smallwood, Robert J. Escape symbol. 291,705, 9-1-87, Cl. D20-30.000.
Herman, Pinky. Foot protector. 291,621, 9-1-87, Cl. D2-271.000.
Hirooka, Junji; and Murakami, Osamu, to Canon Kabushiki Kaisha. Memory card for word processor. 291,698, 9-1-87, Cl. D14-114.000.
Hitachi, Ltd.: *See*—
Nishiyama, Kazuhiko; and Itoh, Takao, 291,689, Cl. D14-1.000.
Hoover, Charles C.: *See*—
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 291,685, Cl. D12-314.000.
Hoyt, Garry, to Fisher Scientific Group Inc. Syringe clip. 291,728, 9-1-87, Cl. D24-27.000.
HTD, Inc.: *See*—
Morris, David L., 291,643, Cl. D7-77.000.
Huckenbeck, Claus O.; and White, Glenn S., to Rain Bird Consumer Products Mfg. Corp. Multiple pattern spray nozzle. 291,725, 9-1-87, Cl. D23-35.000.
International Business Machines Corp.: *See*—
Schaum, David L.; Steinbugler, Robert E.; and Vitello, Jonathan J., 291,696, Cl. D14-113.000.
Sharp, Michael H., 291,695, Cl. D14-113.000.
Itoh, Takao: *See*—
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Jensen, Dale H.: *See*—
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Jerome, Anthony F. Double basket fryer. 291,642, 9-1-87, Cl. D7-43.000.
Jewellery by Varouj Inc.: *See*—
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Kahute, Robert M., to Warner-Lambert Technologies, Inc. Microscope stand with a built-in illuminator. 291,702, 9-1-87, Cl. D16-131.000.
Karamian, Narbik A., to Raf-Tan Inc. Faucet for protecting sterile fluid systems. 291,719, 9-1-87, Cl. D23-3.000.
Kasai, Kazumi. Buckle. 291,668, 9-1-87, Cl. D11-216.000.
Kelln, Norman G.; and Tiffany, Thomas O., to Fisher Scientific Company. Reagent container or similar article. 291,730, 9-1-87, Cl. D24-29.000.
Kelman, Pepi G., to Pepi Kelman, Inc. Ring. 291,664, 9-1-87, Cl. D11-27.000.
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Reid, Donald J., 291,684, Cl. D12-209.000.
Kemp, Willard E. Gate valve. 291,723, 9-1-87, Cl. D23-19.000.
Kemp, Willard E. Gate valve. 291,724, 9-1-87, Cl. D23-19.000.
Keyaki, Keiichi, to Yoshida Kogyo, K. K. Slider for slide fastener. 291,671, 9-1-87, Cl. D11-221.000.
Kiiski, Heikki, to Tunturipyora OY. Ergometer. 291,713, 9-1-87, Cl. D21-195.000.
Klette, John T.; Smith, Harry O.; and Bruns, Eugene C., to Mobil Oil Corporation. Oil container. 291,658, 9-1-87, Cl. D9-352.000.
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Koivisto, Mark. Trampoline. 291,712, 9-1-87, Cl. D21-191.000.
Kojima, Nobuyuki; Sekigawa, Youichi; and Kobiyama, Makoto, to Toshiba Heating Appliances Co., Ltd. Grid-like guard for the front of a portable heater. 291,726, 9-1-87, Cl. D23-127.000.
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Koziol, Walter, to Modern Home Products Corp. Adjustable cooking grid. 291,646, 9-1-87, Cl. D7-332.000.
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McFadden, Richard B. Passenger carrying vehicle. 291,673, 9-1-87, Cl. D12-84.000.
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Morris, David L., to HTD, Inc. Insulated container. 291,643, 9-1-87, Cl. D7-77.000.
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Noble, Charles E. Removable vehicle top. 291,676, 9-1-87, Cl. D12-156.000.
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Ollington, Robert F. Gaming table top. 291,708, 9-1-87, Cl. D21-37.000.
Orlowski, Witold, to Perstorp AB. Waste container. 291,738, 9-1-87, Cl. D34-5.000.
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Wolfe, Henry S. Boat. 291,687, 9-1-87, Cl. D12-316.000.
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Yates, James C. License plate frame. 291,683, 9-1-87, Cl. D12-193.000.
Yoshida Kogyo, K. K.: *See*—
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Takabatake, Hideo, 291,670, Cl. D11-221.000.
Yoshiharu, Takei, to Tasca International Ltd. Handset telephone. 291,693, 9-1-87, Cl. D14-64.000.
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Georges, Calame G. C.; Zintzmeyer, Jorg; and Lux, Peter G. C., 291,706, Cl. D20-42.000.
Zois, Colman. Seat. 291,632, 9-1-87, Cl. D6-379.000.
Zucker, Richard G., to Jonathan Bradley Pens, Inc. Combined memo pad and pen holder. 291,704, 9-1-87, Cl. D19-78.000.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See*—
Christensen, Jack E., 5,998, Cl. 1.000.
Christensen, Jack E., 6,000, Cl. 11.000.

Cameron, James W.: *See*—
Soost, Robert K.; and Cameron, James W., 6,001, Cl. 45.000.

Christensen, Jack E., to Armstrong Nurseries, Inc. Hybrid shrub rose plant cv. Aropiclu. 5,998, 9-1-87, Cl. 1.000.

Christensen, Jack E., to Armstrong Nurseries, Inc. Hybrid tea rose plant cv. Arolical. 6,000, 9-1-87, Cl. 11.000.

Drewlow, Lyndon W., to Mikkelsens, Inc. Impatiens plant named Cirrus. 6,002, 9-1-87, Cl. 68.000.

Drewlow, Lyndon W., to Mikkelsens, Inc. Impatiens plant named Nova. 6,004, 9-1-87, Cl. 68.000.

McRae, Edward A., to Melridge Inc. Asiatic lily plant named 'Tribute'. 6,003, 9-1-87, Cl. 68.000.

Melridge Inc.: *See*—
McRae, Edward A., 6,003, Cl. 68.000.

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Nor'East Miniature Roses, Inc.: *See*—
Utz, Peggy L., 5,999, Cl. 9.000.

Soost, Robert K.; and Cameron, James W., to University of California, The Regents of the. Grapefruit hybrid named Melogold. 6,001, 9-1-87, Cl. 45.000.

University of California, The Regents of the: *See*—
Soost, Robert K.; and Cameron, James W., 6,001, Cl. 45.000.

Utz, Peggy L., to Nor'East Miniature Roses, Inc. Rose plant named Savapeg. 5,999, 9-1-87, Cl. 9.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 1ST DAY OF SEPTEMBER, 1987

Antonuzzi, Anthony P.; Hagel, William E.; Lawson, Donald M.; and Herman, Richard S., to United States of America, Army. High speed lock mechanism. H332, 9-1-87, Cl. 310-78.000.

Bahnck, Thomas, to United States of America, Navy. Aerodynamic housing. H329, 9-1-87, Cl. 367-3.000.

Balcer, Thomas O.: *See*—
Burich, Lawrence R.; and Balcer, Thomas O., H330, Cl. 324-500.000.

Brager, Howard R.; and Garner, Francis A., to United States of America, Energy. Mn-Fe base and Mn-Cr-Fe base austenitic alloys. H326, 9-1-87, Cl. 420-63.000.

Bulgher, David E.: *See*—
Milberger, Walter E.; Lewns, Donald C.; and Bulgher, David E., H335, Cl. 363-16.000.

Burich, Lawrence R.; and Balcer, Thomas O., to United States of America, Navy. Personnel grounding system tester. H330, 9-1-87, Cl. 324-500.000.

Curtis, Richard A., to United States of America, Army. Nonimaging identification structure. H333, 9-1-87, Cl. 455-608.000.

DiSanzo, Carmine P.; and Peake, Clinton J., to FMC Corporation. Nematicidal alkenanilides. H327, 9-1-87, Cl. 564-207.000.

Duthie, Joseph G. M.: *See*—
Gregory, Don A.; Duthie, Joseph G. M.; and Huckabee, Laura L., H331, Cl. 382-31.000.

Fletcher, Aaron N.: *See*—
Henry, Ronald A.; and Fletcher, Aaron N., H334, Cl. 372-53.000.

FMC Corporation: *See*—
DiSanzo, Carmine P.; and Peake, Clinton J., H327, Cl. 564-207.000.

Garner, Francis A.: *See*—
Brager, Howard R.; and Garner, Francis A., H326, Cl. 420-63.000.

Graham, Gregory S.; and White, Harold V., to United States of America, Army. Electromechanical lag angle detector. H323, 9-1-87, Cl. 242-158.00R.

Gregory, Don A.; Duthie, Joseph G. M.; and Huckabee, Laura L., to United States of America, Army. Large memory acousto-optically addressed pattern recognition. H331, 9-1-87, Cl. 382-31.000.

Hagel, William E.: *See*—
Antonuzzi, Anthony P.; Hagel, William E.; Lawson, Donald M.; and Herman, Richard S., H332, Cl. 310-78.000.

Henry, Ronald A.; and Fletcher, Aaron N., to United States of America, Navy. Oxazole dyes. H334, 9-1-87, Cl. 372-53.000.

Herman, Richard S.: *See*—
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Huckabee, Laura L.: *See*—
Gregory, Don A.; Duthie, Joseph G. M.; and Huckabee, Laura L., H331, Cl. 382-31.000.

Johnson, Conrad E.: *See*—
Mallory, Glenn O., Jr.; and Johnson, Conrad E., H325, Cl. 106-1.230.

Kawatake, Satoru: *See*—
Koizumi, Hiroaki; Kawatake, Satoru; and Tokuyama, Kanji, H328, Cl. 544-90.000.

Koizumi, Hiroaki; Kawatake, Satoru; and Tokuyama, Kanji, to Shionogi & Co., Ltd. Purification of cephalosporins. H328, 9-1-87, Cl. 544-90.000.

Lawson, Donald M.: *See*—
Antonuzzi, Anthony P.; Hagel, William E.; Lawson, Donald M.; and Herman, Richard S., H332, Cl. 310-78.000.

Lewns, Donald C.: *See*—
Milberger, Walter E.; Lewns, Donald C.; and Bulgher, David E., H335, Cl. 363-16.000.

Mallory, Glenn O., Jr.; and Johnson, Conrad E., to Richardson Chemical Company. Electroless deposition of transition metals. H325, 9-1-87, Cl. 106-1.230.

Milberger, Walter E.; Lewns, Donald C.; and Bulgher, David E., to United States of America, Army. Converter. H335, 9-1-87, Cl. 363-16.000.

Peake, Clinton J.: *See*—
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Rubin, Donald V., to United States of America, Army. Fence for reducing turbulence. H324, 9-1-87, Cl. 244-117.00R.

Shionogi & Co., Ltd.: *See*—
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Graham, Gregory S.; and White, Harold V., H323, Cl. 242-158.00R.
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Navy: *See*—
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White, Harold V.: *See*—
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CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 1, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

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416	4,689,886

CLASS 33

265	4,689,887
288	4,689,888
408	4,689,889
504	4,689,890
529	4,689,891
533	4,689,892

CLASS 34

13	4,689,894
23	4,689,893
82	4,689,896
103	4,689,897

CLASS 36

43	4,689,898
44	4,689,899
103	4,689,900
126	4,689,901
131	4,689,902

CLASS 37

103	4,689,903
135	4,689,904

CLASS 38

26	4,689,905

CLASS 40

152.1	4,689,906

CLASS 42

50	4,689,907
71.02	4,689,908
87	4,689,909
100	4,689,910
105	4,689,911
	4,689,912

CLASS 43

3	4,689,913
42.22	4,689,914
112	4,689,915

CLASS 44

67	4,690,687
76	4,690,688

CLASS 48

174	4,690,689
214 A	4,690,690

CLASS 49

374	4,689,916
380	4,689,917

CLASS 51

105 GG	4,689,918
206 P	4,689,919
241 S	4,689,920
293	4,690,691
	4,690,692
307	4,690,693
317	4,689,921
358	4,689,922
410	4,689,923

CLASS 52

67	4,689,924
94	4,689,925
169.11	4,689,926
180	4,689,927
235	4,689,928
239	4,689,929
277	4,689,930
442	4,689,931
648	4,689,932
656	4,689,933

CLASS 53

398	4,689,934
431	4,689,935
440	4,689,936
502	4,689,937
582	4,689,938

CLASS 55

4	4,690,694
16	4,690,695
26	4,690,696
84	4,690,697
89	4,690,698
267	4,690,699
302	4,690,700
436	4,690,701

CLASS 56

11.1	4,689,939
228	4,689,940
396	4,689,941

CLASS 57

58.36	4,689,942
90	4,689,943
260	4,689,944
263	4,689,945
301	4,689,946
304	4,689,947
328	4,689,948

CLASS 60

39.12	4,689,949
204	4,689,950
228	4,689,845
275	4,689,951
313	4,689,952
330	4,689,953
338	4,689,954
420	4,689,955
449	4,689,956
481	4,689,957
547.1	4,689,958
602	4,689,959
607	4,689,960
748	4,689,961

CLASS 62

23	4,690,702
54	4,689,962
64	4,689,963
114	4,689,964
155	4,689,965
187	4,689,966
201	4,689,967
225	4,689,968
474	4,689,969
514 R	4,689,970

CLASS 65

265	4,690,703

CLASS 66

25	4,689,971

CLASS 68

20	4,689,972
23.7	4,689,973

CLASS 69

27	4,689,974

CLASS 70

56	4,689,975
208	4,689,976
379 R	4,689,977
431	4,689,978

CLASS 71

90	4,690,704
	4,690,705
91	4,690,706
93	4,690,707
94	4,690,708
98	Re.32,489
120	4,690,709

CLASS 72

57	4,689,979
88	4,689,980
150	4,689,981
334	4,689,982
356	4,689,983
402	4,689,984

CLASS 73

1 R	4,689,985
19	4,689,986
49.3	4,689,987
61 R	4,689,988
61.1 R	4,689,989
118.1	4,689,990
304 C	4,689,991
505	4,689,992
579	4,689,993
634	4,689,994
636	4,689,995
643	4,689,996
652	4,689,997
660	4,689,998
708	4,689,999
741	4,690,000
800	4,690,001
861.25	4,690,002
862.32	4,690,003
862.64	4,690,004
864.12	4,690,005
866.5	4,690,006

CLASS 74

5.12	4,690,007
336 R	4,690,008
409	4,690,009
469	4,690,010
475	4,690,011
479	4,690,012
501 M	4,690,013
501 R	4,690,014
665 GE	4,690,015
687	4,690,016
866	4,690,017

CLASS 75

0.5 AA	4,690,710
244	4,690,711

CLASS 76

101 R	4,690,018

CLASS 81

99	4,690,019

CLASS 82

2 D	4,690,020

CLASS 83

71	4,690,021
308	4,690,022
700	4,690,023
852	4,690,024

CLASS 84

1.18	4,690,025
1.19	4,690,026
298	4,690,027
314 N	4,690,028

CLASS 86

20.11	4,690,029

CLASS 89

1.13	4,690,030
36.13	4,690,031
43.01	4,690,032

CLASS 91

43	4,690,033
369 A	4,690,034
442	4,690,035
506	4,690,036

CLASS 92

130 R	4,690,037
181 R	4,690,038

CLASS 98

2.08	4,690,039
2.14	4,690,040
57	4,690,041
115.1	4,690,042

CLASS 99

353	4,690,043
419	4,690,044
485	4,690,045
533	4,690,046
542	4,690,047
575	4,690,048

CLASS 100

214	4,690,049

CLASS 101

35	4,690,050
211	4,690,051
216	4,690,052
328	4,690,053
409	4,690,054
451	4,690,055

CLASS 102

202.2	4,690,056
266	4,690,057
312	4,690,058
336	4,690,059
352	4,690,060
401	4,690,061
476	4,690,062
530	4,690,063

CLASS 104

119	4,690,064
172.3	4,690,065
282	4,690,066

CLASS 105

3	4,690,067
8.1	4,690,068
224.1	4,690,069
377	4,690,070
404	4,690,071
406.1	4,690,072

CLASS 106

30	4,690,712
287.16	4,690,713

CLASS 109

59 T	4,690,073

CLASS 110

264	4,690,074
	4,690,075
347	4,690,076

CLASS 112

113	4,690,077
121.12	4,690,078
162	4,690,079
	4,690,080
254	4,690,082
	4,690,083
266.1	4,690,084
276	4,690,081

CLASS 114

20.2	4,690,085
39	4,690,086
50	4,690,087
102	4,690,088
141	4,690,089
218	4,690,090
221 A	4,690,091
222	4,690,092
270	4,690,093
284	4,690,094

CLASS 116

67 R	4,690,095

CLASS 118

657	4,690,096
723	4,690,097
727	4,690,098

CLASS 119

14.41	4,690,099
15	4,690,100
52 R	4,690,101

CLASS 122

13 R	4,690,102

CLASS 123

41.12	4,690,103
41.32	4,690,104
41.82 R	4,690,105
52 M	4,690,106
65 V	4,690,107
73 A	4,690,109
73 AD	4,690,108
90.17	4,690,110
192 B	4,690,111
195 R	4,690,112
197 AC	4,690,113
357	4,690,114
366	4,690,115
425	4,690,116
492	4,690,117
533	4,690,118
571	4,690,119
	4,690,120
589	4,690,121
609	4,690,122
612	4,690,123
643	4,690,124

CLASS 126

25 A	4,690,125
77	4,690,126
85 B	4,690,129
391	4,690,127
450	4,690,128

CLASS 128

1.3	4,690,130
4	4,690,131
	4,690,132
25 R	4,690,133
64	4,690,134
79	4,690,135
130	4,690,136
132 D	4,690,137
207.15	4,690,138
305	4,690,140
305.5	4,690,139
396	4,690,141
419 P	4,690,143
419 R	4,690,142
	4,690,144
421	4,690,145
422	4,690,146
635	4,690,147
639	4,690,148
653	4,690,149
660	4,690,150
682	4,690,151
734	4,690,152
763	4,690,153
765	4,690,154
786	4,690,155
804	4,690,156

CLASS 131

276	4,690,157

CLASS 134

107	4,690,158
167 C	4,690,159
181	4,690,160

CLASS 135

99	4,690,161

CLASS 136

246	4,691,075
250	4,691,076
256	4,691,077

CLASS 137

1	4,690,162
8	4,690,163
15	4,690,164
112	4,690,165
119	4,690,166
382	4,690,167
554	4,690,168
614.16	4,690,169
624.11	4,690,170
877	4,690,171

CLASS 138

89	4,690,172
118.1	4,690,173
121	4,690,174
131	4,690,175

CLASS 139

110	4,690,176
449	4,690,177
455	4,690,178

CLASS 141

1	4,690,179
51	4,690,180
388	4,690,181
392	4,690,182

CLASS 144

2 N	4,690,183
2 Z	4,690,184
34 R	4,690,185
176	4,690,186
340	4,690,187
378	4,690,188

CLASS 148

6.15 R	4,690,715
11.5 F	4,690,716

CLASS 152

209 R	4,690,189
213 A	4,690,190
527	4,690,191

CLASS 156

48	4,690,718
201	4,690,719
248	4,690,720
250	Re.32,490
307.5	4,690,721
510	4,690,722
541	4,690,723
584	4,690,724
617 R	4,690,725
624	4,690,726
635	4,690,727
643	4,690,728
	4,690,729
	4,690,730

CLASS 160

57 4,690,192
133 4,690,193
265 4,690,194
310 4,690,195

CLASS 162

45 4,690,731

CLASS 164

58.1 4,690,196
312 4,690,197
316 4,690,198
421 4,690,199
504 4,690,200
516 4,690,201

CLASS 165

25 4,690,203
44 4,690,204
45 4,690,205
81 4,690,206
113 4,690,207
119 4,690,208
150 4,690,209
159 4,690,210
177 4,690,211

CLASS 166

65.1 4,690,212
84 4,690,213
250 4,690,214
261 4,690,215
264 4,690,216
274 4,690,217
297 4,690,218
307 4,690,219
382 4,690,220
4,690,221

CLASS 168

4 4,690,222

CLASS 172

44 4,690,223
45 4,690,224

CLASS 173

116 4,690,225
128 4,690,226

CLASS 174

68.5 4,691,078
87 4,691,079
88 R 4,691,080
105 R 4,691,081
106 SC 4,691,082
135 4,691,083

CLASS 175

4.56 4,690,227
24 4,690,228
325 4,690,229

CLASS 177

229 4,690,230

CLASS 180

6.48 4,690,231
89.14 4,690,232
142 4,690,233
182 4,690,234
210 4,690,235
219 4,690,236
4,690,237
248 4,690,238
249 4,690,239
287 4,690,240
315 4,690,241

CLASS 181

0.5 4,690,242
146 4,690,244
272 4,690,245

CLASS 182

2 4,690,246
63 4,690,247
118 4,690,248

CLASS 184

6.4 4,690,249

CLASS 187

18 4,690,250
101 4,690,243
107 4,690,251

CLASS 188

69 4,690,252
72.7 4,690,253
73.36 4,690,254
287 4,690,255

CLASS 191

12.2 R 4,691,084

CLASS 192

3.31 4,690,257
21 4,690,256
58 C 4,690,258
70.28 4,690,259
71 4,690,260
87.13 4,690,261
111 A 4,690,262

CLASS 194

317 4,690,263

CLASS 198

335 4,690,264
347 4,690,265
388 4,690,266
396 4,690,267
399 4,690,268
460 4,690,269
774 4,690,270

CLASS 200

1.7 4,690,271
151 4,691,085
159 R 4,691,086

CLASS 202

100 4,690,732

CLASS 203

21 4,690,733
56 4,690,734

CLASS 204

37.1 4,690,735
38.3 4,690,736
129.7 4,690,737
130 4,690,738
131 4,690,739
147 4,690,740
149 4,690,741
157.2 4,690,742
168 4,690,743
192.11 4,690,744
192.29 4,690,745
192.32 4,690,746
206 4,690,747
279 4,690,748
299 R 4,690,749

CLASS 206

36 X 4,690,276
45.28 4,690,272
105 4,690,273
328 4,690,274
331 4,690,275
362.1 4,690,277
387 4,690,278
531 4,690,279
554 4,690,280
597 4,690,281
626 4,690,282

CLASS 208

310 Z 4,690,750

CLASS 209

3.3 4,690,751
5 4,690,752
496 4,690,753
549 4,690,283
590 4,690,284

CLASS 210

94 4,690,754
96.1 4,690,755
221.2 4,690,756
232 4,690,757
247 4,690,758
304 4,690,759
321.5 4,690,760
330 4,690,761
436 4,690,762
496 4,690,763
629 4,690,764
654 4,690,765
4,690,766

CLASS 211

41 4,690,285
4,690,286
49.1 4,690,287
113 4,690,288
186 4,690,289

CLASS 212

267 4,690,290

CLASS 215

32 4,690,291
201 4,690,292

CLASS 219

10.55 B 4,691,087
10.55 F 4,691,088
69 W 4,691,089
121 LC 4,691,093
121 LD 4,691,092
121 LM 4,691,091
121 PC 4,691,090
121 PR 4,691,094
222 4,691,095
441 4,691,096
513 4,691,097

CLASS 220

86 R 4,690,293
90.2 4,690,294
207 4,690,295
259 4,690,296
273 4,690,297
325 4,690,298
402 4,690,299
412 4,690,300

CLASS 221

2 4,690,301
11 4,690,302
131 4,690,303

CLASS 222

44 4,690,304
52 4,690,305
80 4,690,306
95 4,690,307
156 4,690,308
249 4,690,309
309 4,690,310
324 4,690,311
402.17 4,690,312
454 4,690,313

CLASS 224

211 4,690,314
252 4,690,315
253 4,690,316

CLASS 227

67 4,690,317

CLASS 228

57 4,690,318
182 4,690,319
194 4,690,320

CLASS 229

40 4,690,321
80 4,690,322

CLASS 236

99 F 4,690,323

CLASS 237

8 R 4,690,324

CLASS 239

124 4,690,325
223 4,690,326
226 4,690,327
227 4,690,328
265.19 4,690,329
265.39 4,690,330
333 4,690,331
338 4,690,332
434.5 4,690,333
452 4,690,334

CLASS 241

24 4,690,335
30 4,690,336
36 4,690,337
56 4,690,338
73 4,690,339
236 4,690,340
275 4,690,341

CLASS 242

35.5 A 4,690,342
55.3 4,690,343
55.53 4,690,345
56 R 4,690,346
57.1 4,690,347
66 4,690,348
75.5 4,690,349

CLASS 244

3.1 4,690,350
3.16 4,690,351
134 D 4,690,353
158 R 4,690,354
173 4,690,355

CLASS 248

68.1 4,690,356
99 4,690,357
297.3 4,690,358
300 4,690,359
346 4,690,360
352 4,690,361
404 4,690,362
449 4,690,363
503.1 4,690,364
650 4,690,365
676 4,690,366

CLASS 249

6 4,690,367
37 4,690,368
49 4,690,352
55 4,690,369
114 R 4,690,370

CLASS 250

201 4,691,098
213 VT 4,691,099
223 R 4,691,100
231 SE 4,691,101
256 4,691,102
311 4,691,103
338 4,691,104
4,691,105
349 4,691,106
370 4,691,107
385 4,691,108
426 4,691,109
458.1 4,691,110
551 4,691,111
570 4,691,112
577 4,691,113
578 4,691,114

CLASS 251

65 4,690,371
129.02 4,690,373
4,690,374
129.1 4,690,372
342 4,690,375
354 4,690,377

CLASS 252

47 4,690,767
62.58 4,690,768
70 4,690,769
99 4,690,770
102 4,690,771
106 4,690,772
174.12 4,690,773
309 4,690,774
312 4,690,775
315.3 4,690,776
373 4,690,777
506 4,690,778
546 4,690,779
572 4,690,780
626 4,690,782
633 4,690,781

CLASS 254

8 B 4,690,378
327 4,690,376
347 4,690,379
394 4,690,380
4,690,381

CLASS 256

1 4,690,382
24 4,690,383
47 4,690,384

CLASS 260

104 4,690,783
403 4,690,784
505 N 4,690,785

CLASS 264

4.6 4,690,786
16 4,690,787
22 4,690,788
40.1 4,690,789
63 4,690,790
122 4,690,791
235.8 4,690,792

CLASS 266

44 4,690,385
4,690,386
144 4,690,387

CLASS 267

35 4,690,388
140.1 4,690,389
155 4,690,390

CLASS 269

21 4,690,391

CLASS 271

2 4,690,392
4 4,690,393
11 4,690,394
98 4,690,395
311 4,690,396

CLASS 272

53.2 4,690,397
72 4,690,398
122 4,690,399
123 4,690,400
137 4,690,401
4,690,402

CLASS 273

25 4,690,403
67 R 4,690,404
73 C 4,690,405
73 J 4,690,406
81 A 4,690,407
169 4,690,408
299 4,690,409
4,690,410

CLASS 277

166 4,690,411
184 4,690,412
199 4,690,413
207 A 4,690,414

CLASS 279

4 4,690,415
110 4,690,416

CLASS 280

42 4,690,417
96.1 4,690,418
154.5 R 4,690,419
289 A 4,690,420
403 4,690,421
460 R 4,690,422
605 4,690,423
633 4,650,424
668 4,690,425
690 4,690,426
694 4,690,427
697 4,690,428
707 4,690,429
708 4,690,430
711 Re.32,486
771 4,690,431
775 4,690,432

CLASS 283

1 B 4,690,433

CLASS 285

31 4,690,434
256 4,690,435
321 4,690,436
356 4,690,437
363 4,690,438

CLASS 290

1 R 4,691,115

CLASS 292

27 4,690,439
54 4,690,440
57 4,690,441
218 4,690,442
307 R 4,690,443
324 4,690,444
341 4,690,445

CLASS 293

128 4,690,446

CLASS 294

57 4,690,447

CLASS 296

37.8 4,690,448
65 R 4,690,449
97 G 4,690,451
97 K 4,690,450
216 4,690,452
4,690,453

CLASS 297

89 4,690,454
238 4,690,455
284 4,690,456
337 4,690,457
379 4,690,458
458 4,690,459

CLASS 299

21 4,690,460
39 4,690,461

CLASS 301

9 CN 4,690,462

CLASS 303

37 4,690,463
115 4,690,464
119 4,690,465

CLASS 307

10 R 4,691,116
66 4,691,118
84 4,691,119
119 4,691,117
265 4,691,120
269 4,691,121
279 4,691,122
296 R 4,691,123
303 4,691,124
353 4,691,125
441 4,691,126
475 4,691,127
557 4,691,128
581 4,691,129

CLASS 310

11 4,691,130
54 4,691,131
156 4,691,132
178 4,691,133
234 4,691,134
254 4,691,135
339 4,691,136

CLASS 312

29 4,690,466
198 4,690,467
291 4,690,468
330 R 4,690,469

CLASS 313

30 4,691,137
403 4,691,138
413 4,691,139
486 4,691,140
565 4,691,141
623 4,691,142

CLASS 315

133 4,691,143
169.3 4,691,144
4,691,145
287 4,691,146
371 4,691,147

CLASS 318

12 4,691,148
331 4,691,149
4,691,150
571 4,691,151
616 4,691,152
696 4,691,153
4,691,154
771 4,691,155
798 4,691,156

CLASS 320

2 4,691,157
14 4,691,158

CLASS 321

20 4,689,895

CLASS 323

222 4,691,159

CLASS 324

71.3 4,691,160
73 R 4,691,161
309 4,691,162
318 4,691,163
322 4,691,164
326 4,691,165
334 4,691,166
438 4,691,167
439 4,691,168
448 4,691,169

CLASS 328

20 4,691,170
167 4,691,171

CLASS 330

129 4,691,172
144 4,691,173
260 4,691,174

CLASS 331

1 A 4,691,175
2 4,691,176

CLASS 333

113 4,691,177
143 4,691,178
202 4,691,179

CLASS 335

6 4,691,180
128 4,691,181
176 4,691,182
289 4,691,183

CLASS 337

49 4,691,184

CLASS 338

32 H 4,691,185
34 4,691,186
114 4,691,187
307 4,691,188

CLASS 340

347 AD 4,691,189
4,691,190
347 DD 4,691,193
347 P 4,691,191
4,691,192
405 4,691,194
545 4,691,195
578 4,691,196
638 4,691,197
649 4,691,198
710 4,691,199
784 4,691,200
825.31 4,691,201

825.54 4,691,202
856 4,691,203

CLASS 342

22 4,691,204
365 4,691,205

CLASS 343

700 MS 4,691,206
766 4,691,207
785 4,691,208
846 4,691,209

CLASS 346

76 PH 4,691,210
4,691,211
108 4,691,212
159 4,691,213

CLASS 350

6.5 4,690,485
6.6 4,690,486
96.12 4,690,488
96.14 4,690,489
96.15 4,690,490
96.16 4,690,491
96.20 4,690,492
4,690,493
4,690,494
96.21 4,690,487
4,690,495
4,690,496
96.23 4,690,497
4,690,498
4,690,499
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DESIGN PATENTS

01	:	291,737		291,673		291,731		291,735		291,690	291,682
05	:	291,620		291,686	21	: 291,643	29	: 291,718		291,696	291,705
		291,685		291,687		291,676	34	: 291,622		291,702	291,723
06	:	291,628		291,688	24	: 291,719		291,656		291,704	291,724
		291,634		291,716	25	: 291,734		291,720	39	: 291,642	291,728
		291,636	13	: 291,644	26	: 291,677		291,721		291,657	49 : 291,674
		291,662	17	: 291,630		291,678		291,722		291,710	51 : 291,641
		291,664		291,637		291,679		291,732	41	: 291,683	291,658
		291,715		291,638		291,680		291,733	42	: 291,635	291,697
		291,725		291,639		291,681	36	: 291,624	45	: 291,626	291,699
08	:	291,623		291,645		291,684		291,625		291,627	291,714
		291,663		291,646	27	: 291,649		291,632	47	: 291,659	53 : 291,727
12	:	291,621		291,647		291,651		291,633		291,711	291,730
		291,655		291,707		291,712		291,653	48	: 291,654	56 : 291,629
		291,672	18	: 291,729	28	: 291,709		291,660			

PLANT PATENTS

06	:	5,998									
		6,000		6,001	18	: 5,999	39	: 6,002		6,004	40 : 6,003

STATUTORY INVENTION REGISTRATIONS

01	:	H323		H331	06	: H325		H334	25	: H332	42 : H329
		H324		H333		H330	24	: H335	34	: H327	53 : H326

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PLANT PATENTS

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